Emulex Drivers for VMware ESX/ESXi 4.1

User Manual

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Emulex Connects™
Servers, Storage and People

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Supported Driver Versions

Driver Version	Comments
FC/FCoE Drivers	
8.2.1.86.26	
8.2.1.90.28	
8.2.1.105.34	
NIC Drivers	
2.102.518.0	
2.102.554.0	
2.103.377.0	
2.104.277.3	
4.0.306.0	
iSCSI Drivers	
2.102.525.9	
4.0.317.0	

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Installation

Driver Information

Supported Features

- Supports the Emulex OneConnect family of UNCAs and Emulex HBA adapters.
- Supports dynamic parameter setting using the OneCommand™ Manager application, version 5.2, from Emulex. It is a GUI and CLI-based configuration utility used as part of a master kit, enabling driver configuration including:
    - Supports the CIM interface through OneCommand Manager to manage ESX/ESXi
    - Out-of-band (TCP/IP) remote SAN management capability
    - Diagnostics (loopback and diagnostic dump [except for OneConnect adapters])
    - Virtual port NPIV view vports only

  See the OneCommand Manager User Manual for a complete list of supported features.
- Supports the following protocols:
    - iSCSI hardware offload
    - NIC
    - Fibre Channel (FC)/Fibre Channel over Ethernet (FCoE)
    - Fibre Channel initiator mode
    - SCSI-FCP
    - FCP-2
- SNIA-CTP compliant SMI-S 1.1 Provider
- Supports the following topologies:
    - FC-AL (Fibre Channel Arbitrated Loop)
    - Point-to-point
    - Fabric with auto-topology negotiation
- Supports FC in-band management
- Supports 1, 2, 4, 8, and 10-Gb/s capable adapters with auto-rate negotiation. (1 Gb/s is not supported on 8 Gb/s adapters.)
- Tested with up to sixteen adapter ports
- Support for Common HBA API
- Batch firmware download capability
- PCI hot-plug support (vendor specific)
- VPD (Vital Product Data) support
- NPIV (N_Port ID Virtualization) support
- Adapter personality change support

New Features in this Release

- Supports OneConnect OCe11102-xT 10GBASE-T UCNAs

Prerequisites

- There are no prerequisites at this time.

Compatibility

- For a list of adapters that are compatible with this driver, see the driver Downloads page on the Emulex website. For compatible firmware versions, see the Downloads page for the specific adapter.

Things to Know Before You Download

- The driver is matched to a particular version of the Emulex Core Kit, the adapter firmware, and the NIC driver. Refer to the Downloads page on the Emulex website for details.

Known Issues

- See the product release notes for the latest information.

Installing the FC/FCoE Driver

Introduction

This part of the guide provides installation information for the Emulex OneCommand™ Manager application using the FC/FCoE interface. Before using this product, you need a working knowledge of FC/FCoE, TOE (TCP Offload Engine) technology, and the fundamentals of network storage devices.

Installing the FC/FCoE Driver and Management Software

The Emulex driver is available through the VMware support site. Refer to the VMware support website for further details.

See the OneCommand Manager Command Line User Interface Manual for instructions on how to install the application on the ESX COS.

Note: Before installing the Emulex OneCommand Manager Kit, you must install the lpfc driver from the VMware website.

Note: Before installing OneConnect network drivers and management software, verify that the firmware version is correct. If it is, proceed with the installation. If it is not, update the firmware using the OneCommand Manager application and reboot your system before proceeding with the installation.

Uninstalling the FC/FCoE Driver

See the VMware Patch Download page for instructions.

Installing the FC/FCoE Utilities

Follow these instructions to install the OneCommand Manager application.

Note: The FC/FCoE utilities are installable on ESX only. For ESXi, download and install the OneCommand Manager for VMware vCenter software plug-in.

To install the OneCommand Manager agent:

1. Log in as ‘root.’
2. Copy the `elxocmcore-esx41-<kit version>.x86_64.rpm` file to a directory on the install machine.
3. CD to the directory to which you copied the RPM file.
4. Install the RPM file. Type:

   ```
   rpm -U elxocmcore-esx41-<kit version>.x86_64.rpm
   ```

   For example:

   ```
   rpm -U elxocmcore-esx41-5.2.12.1-1.x86_64.rpm
   ```

   The RPM file contents are installed in /usr/sbin/ocmanager. The CLI utility is also located in this directory.

Uninstalling the FC/FCoE Utilities

Follow these instructions to uninstall the Emulex configuration utilities. To uninstall the OneCommand Manager agent:

1. Log in as ‘root.’
2. Type "`rpm -qa | grep elx`" to verify that this kit is installed. This command should list "`elxocmcore-esx41-<kit version>`" for the current release.
3. Type:

   ```
   rpm -e elxocmcore-esx41-<kit version>
   ```

Installing the NIC Driver

Introduction

This part of the guide provides installation information for the Emulex OneConnect UCNA. Before using this product, you need a working knowledge of the NIC (network interface card), TOE (TCP offload engine) technology, and the fundamentals of network-storage devices.

Installing the NIC Driver and Management Software

The Emulex NIC driver for VMware ESX 4.1 is available through the VMware support site. The VMware support website also includes a documentation link to the correct installation procedures for this driver. Follow the installation instructions provided on the VMware support website.

See the OneCommand Manager Command Line User Manual for instructions on installing the Emulex core kit.

Note: Before installing the Emulex OneCommand Manager Kit, you must install the lpfc driver from the VMware website.

Note: Before installing OneConnect network drivers and management software, verify that the firmware version is correct. If it is, proceed with the installation. If it is not, update the firmware using the OneCommand Manager application and reboot your system before proceeding with the installation.

Uninstalling the NIC Driver

See the VMware Patch Download page for instructions.

Installing the iSCSI Driver

Introduction

This part of the guide provides installation information for the Emulex OneConnect UCNA. Before using this product, you need a working knowledge of iSCSI, TOE (TCP offload engine) technology, and the fundamentals of network-storage devices.

To install the driver for ESX Server, you must use the ESX installation DVD and the ESX driver ISO image provided on the Emulex website. To use the driver ISO images, you must first burn the ISO image file to a CD-ROM.

Performing a Fresh Installation of ESX Server

To do a fresh install of ESX Server 4.1 in a server with OneConnect hardware, you will need the ESX installation DVD and the ESX driver CD you created to begin driver installation. If OneConnect is the only network interface in your server or if you wish to install ESX Server in an iSCSI target drive connected to the OneConnect, the OneConnect iSCSI driver must be loaded from the driver CD during ESX Server installation. Follow these steps to do this:

1. Before you begin, make sure that the Emulex firmware version matches the ESX Server 4.1 driver version.
2. Place the ESX installation DVD in the DVD drive of the host to start the installation of ESX Server 4.1.
3. Follow the on-screen prompts to continue the installation process.
4. When prompted for Custom Drivers, select **Yes** to install custom drivers.
5. Click **Add** to eject the ESX installation DVD.
6. Place the driver CD in the DVD drive of the ESX host and select **driver module** to import the drivers.
7. Click **Next** to continue.
8. When prompted to load the system drivers, click **Yes**.
9. After loading the drivers, follow the prompts to continue installing ESX Server. After the drivers are installed, you will be prompted to swap the driver CD with the ESX installation DVD.
10. After you install ESX Server, you can create your Virtual Machines (VMs) by following the VMware instructions. Refer to the VMware ESX Server 4.1 documentation for more information.

Adding or Upgrading the iSCSI Driver in an Existing ESX Server

You can add the OneConnect adapter and driver to an existing ESX Server installation, or upgrade a local or an iSCSI boot installation of an ESX Server with the OneConnect controller to a newer version of OneConnect software. To do this, run the install.sh script. To install the OneConnect and ESX Server with the install.sh script, do the following:

1. Insert the Install CD into your CD-ROM drive.

2. Change directory from where the CD was mounted to CD1/ESX/Installer. For example:

   ```
   /home/sengines/ # cd CD1/ESX/Installer
   ```

3. From the installer directory, type:

   ```
   sh ./Install.sh
   ```

   The RPM files will install automatically as well as the firmware.

4. The system will prompt you to reboot. Type y or n.
5. After the system reboots, you can create your VMs by following the VMware instructions. Refer to the VMware ESX Server 4.1 documentation for more information.

If you want to load the drivers during boot (initrd), follow these steps:

1. From the installer directory, type:

   ```
   sh ./Install.sh
   ```

   The RPM files will install automatically as well as the firmware.

2. Update the initrd by typing the command:

   ```
   esxcfg-boot -b
   ```

3. Reboot the system.

Performing Silent/Unattended Installation

The OneConnect software installation utility supports Silent Installation (or Unattended) mode for ESX Server. Silent installation is a script file driven mode of installation that does not require any user input to complete.

This section describes how to invoke the installation utility in silent mode. When running in silent mode, the installation utility will install all software automatically. Upon completion, the installation utility provides an exit code describing the outcome of the update.

Invoking Silent Install in ESX Server

To invoke Silent install in ESX Server, do the following:

1. Run the following command line where Install.sh is located to start Silent Install:

   ```
   sh Install.sh -- -s
   ```

2. Run this command to get the exit code:

   ```
   echo $?
   ```

Exit Codes

The OneConnect Server Software Installer implements the following exit codes in VMware ESX Server. Note that all values are in decimal:

0 - Success. All software was installed correctly with no errors. A system reboot is not required.

10 - Success. All software was installed correctly with no errors. A system reboot is required.

12 - OneConnect firmware update failed.

13 - OneConnect not detected in the system.

14 - The installer was executed on a board with an unsupported configuration.

15 - Insufficient disk space to install OneConnect software.

17 - The Installer was executed by a system user that is not a superuser.

18 - Operating system you are using is not supported by installer.

20 - Invalid command syntax.

Uninstalling the iSCSI Driver

The uninstall file is copied to your system during the OneConnect Server Software installation process for the ESX Server. After you have installed the Server software, you can find the uninstall.sh file on your local system in the following location:

/opt/Emulex/OneConnect/uninstall.sh

Removing the iSCSI Driver from initrd

When uninstalling OneConnect Server software from your system, the iSCSI driver will remain in the initrd. To completely remove the OneConnect software from your system, you will need to manually remove the iSCSI driver from initrd. To do this, follow these steps:

1. From the uninstall.sh location, uninstall the driver by typing:
   ```
   sh ./uninstall.sh
   ```
2. Update the initrd by typing the command:
   ```
   esxcfg-boot -b
   ```
3. Reboot the system.

Invoking Silent Uninstall

The OneConnect software installation utility also supports Silent Uninstall mode for ESX Server. To invoke silent uninstall do the following:

1. Run the following command line to start Silent Uninstall:
   ```
   sh Uninstall.sh -- -s
   ```
2. Run this command to get the exit code:
   ```
   echo $?
   ```

Uninstall Exit Codes

The OneConnect Server Software Installer implements the following exit codes in VMware ESX Server. Note that all values are in decimal:

0 - RPM not found.

10 - Success. All software was un-installed correctly with no errors. A system reboot is required.

17 - The Installer was executed by a system user that is not a superuser.

20 - Invalid command syntax.

Installing All the Drivers

To install all drivers, use the 'esxupdate' utility provided by VMware in ESX and ESXi platforms. The drivers and components that can be installed include:

- LPFC
- NIC
- iSCSI

esxupdate Procedure

For esxupdate installs, perform the following procedure.

Directly mount the ISO image in this manner:

```
[root@testmachine ~]# mkdir /tmp/mountpoint
[root@testmachine ~]# mount -r -o loop /path/to/driver.iso /tmp/
mountpoint
```

Once the ISO image is mounted, you can access the offline bundle in the /tmp/mountpoint/offline-bundle/ directory. Since the offline bundle file name varies depending on the package that is to be installed, the example below uses the name 'offline-bundle.zip' - please replace this file name with the name of the offline bundle to be installed

An offline bundle can be installed on a VMware ESX server locally using the "esxupdate" command. The following example uses the offline bundle file name "offline-bundle.zip"; when using this example as a reference, make sure to use the file name of the offline bundle to be installed (note the "--maintenance" parameter is required for FCoE, NIC, and iSCSI driver installations):

```
[root@testmachine ~]# esxupdate --nosigcheck --maintenancemode --
bundle= <offline-bundle.zip>
```

Reboot the VMware ESX server to activate the new drivers.

LPFC Driver

The LPFC driver is the driver used for HBA adapters and the UCNA adapter FCoE ports. To install the lpfc driver, execute the following command in the command prompt of the ESX/ESXi host:

```
# mkdir /tmp/mountpoint
# mount -r -o loop /path/to/driver.iso /tmp/mountpoint
# esxupdate --maintenancemode update --bundle=<lpfc driver.zip>
```

where <lpfc driver.zip> is the lpfc driver released as zip file.

NIC Driver

The NIC driver is the driver for the NIC ports of the UCNA adapters. To install the NIC driver, execute the following command in the command prompt of the ESX/ESXi host:

```
# mkdir /tmp/mountpoint
# mount -r -o loop /path/to/driver.iso /tmp/mountpoint
# esxupdate --maintenancemode update --bundle=<offline-bundle.zip>
```

where <offline-bundle.zip> is the be NIC driver released as an zip file.

iSCSI Driver

The iSCSI driver is the driver for the iSCSI ports of the UCNA adapters. To install the iSCSI driver, execute the following command in the command prompt of the ESX/ESXi host:

```
# mkdir /tmp/mountpoint
# mount -r -o loop /path/to/driver.iso /tmp/mountpoint
# esxupdate --maintenancemode update --bundle=<be2iscsi.zip>
```

where <be2iscsi.zip> is the iSCSI driver released as zip file.

Installing the Out-of-Box Driver

Use the VMware ESX driver CD to install drivers on ESX or ESXi installations.

You can use the driver CD:

- To install drivers for devices as part of a new ESX installation.
- To update existing drivers or install new drivers for an existing ESX installation with esxupdate.
- To update existing drivers or install new drivers for an existing ESX or ESXi installation with vihostupdate.

Installing Drivers for Devices as Part of a New ESX Installation (ESX Only)

Note: This procedure has changed since the 3.5 version of driver CD. You will need the ESX installation DVD to begin.

1. Insert the ESX installation DVD in the DVD drive of the host.
2. Restart the host.
3. Accept the terms of the license agreement.
4. Select a keyboard type.
5. When prompted for Custom Drivers, select **Yes** to install custom drivers.
6. Click **Add** to eject the ESX installation DVD.
7. Insert the driver CD in the DVD drive of the ESX host.
8. Select driver module to import drivers to the ESX host.
9. Click **Next** to continue. A dialog box displays the following message:

   ```
   Load the system drivers.
   ```

10. Click **Yes**. After loading the driver module, continue installing ESX. After the drivers are installed you are prompted to swap the driver CD with the ESX installation DVD. Complete the installation of ESX.
11. After the operation system installation is complete and the system has rebooted, run the following from the console command line:

    ```
    # rpm -e vmware-esx-drivers-scsi-be2iscsi
    ```

12. Insert the driver CD into CD-ROM drive of the ESX host.
13. Mount the driver CD.
14. Navigate to <cd mount point>/offline-bundle/ and locate the <offline-bundle>.zip file.
15. Run the esxupdate command to install the drivers using the offline bundle.

    ```
    esxupdate --maintenancemode --bundle=<offline-bundle>.zip update
    ```

Updating or Adding Drivers on Existing ESX Installations Using esxupdate (ESX Only)

1. Power on the ESX host and log into an account with administrator capability.
2. Place the driver CD in the CD-ROM drive of the ESX host.
3. Mount the driver CD.
4. Navigate to <cd mount point>/offline-bundle/ and locate the <offline-bundle>.zip file.
5. Run the esxupdate command to install drivers using the offline bundle.

   ```
   esxupdate --bundle=<offline-bundle>.zip update
   ```

Updating or Adding Drivers on Existing ESX and ESXi Installations Using vihostupdate (ESX and ESXi)

1. Power on the ESX or ESXi host.
2. Insert the driver CD in the CD-ROM drive of the host where either the vSphere CLI package is installed or vMA is hosted.
3. Mount the driver CD.
4. Navigate to <cd mount point>/offline-bundle/ and locate the <offline-bundle>.zip file.
5. Run the vihostupdate command to install drivers using the offline bundle.

   ```
   vihostupdate <conn_options> --install --bundle <offline-bundle>.zip
   ```

   (For more details on vihostupdate, see the vSphere Command-Line Interface Installation and Reference Guide.)

Virtualization Features

For the best performance, you must install VMware Tools in each guest operating system. For information on installing VMware Tools in a Linux or Windows guest operating system, refer to the VMware ESX Server 4.1 documentation.

Enabling the NetQueue Feature

To use the multiple interface feature in ESX Server, you must enable the NetQueue feature in ESX Server. The NetQueue feature is enabled by default.

- To determine if NetQueue is enabled, run the following command from the ESX Server console:

  ```
  # esxcfg-advcfg -j netNetqueueEnabled
  ```

  If 'netNetqueueEnabled = FALSE' is returned, the feature is disabled.
- To enable NetQueue, run the following command:

  ```
  # esxcfg-advcfg -k TRUE netNetqueueEnabled
  ```

Reboot the ESX Server for the change to take effect.

How an ESX Server Creates and Names Interfaces

The NIC driver supports a maximum of four UCNAs per system. For dual-channel UCNAs running in standard operating mode, the driver creates two interfaces (one for each physical port). The first and second interfaces are respectively named vmnic0 and vmnic1 (assuming there are no other network interfaces in your configuration). The same applies to virtual NIC (vNIC)-capable UCNAs when vNIC mode is disabled in the adapter BIOS (for those boards that support vNIC).

When vNIC mode is enabled in the adapter BIOS and the UCNA is in NIC only mode, the driver creates eight interfaces (four for each physical port). When vNIC mode is enabled in the adapter BIOS and the UCNA is in FCoE or iSCSI mode, the driver creates only 6 NIC interfaces. The other two interfaces are reserved for the FCoE and iSCSI. The interfaces are labeled vmnic0 through vmnic7 (assuming there are no other network interfaces in your configuration). All eight vNICs are fully functional and support the same feature set as a standard NIC. The vNICs can also be linked to a virtual switch in the same way:

```
# esxcfg-nics -l //list recognized nics
# esxcfg-vswitch -l //list available vswitches
# esxcfg-vswitch -a vSwitch0 //create vSwitch0
# esxcfg-vswitch -A VMNet0 vSwitch0 //create virtual machine
network, VMNet0 and add it to vSwitch0
# esxcfg-vswitch -L vmnic0 vSwitch0 //link vmnic0 to vSwitch0
```

The only difference being that in vNIC mode, each of the four vNICs tied to a physical port share the port's 10GbE bandwidth.

Configuring VLANs

VLAN filtering is supported in the hardware. To configure VLANs, create the vSwitch with the required VLAN ID and use this interface as an adapter to this vSwitch. A native VLAN can also be configured in the guest operating system in VGT (Virtual Guest Tagging) mode. (For example, using vconfig in the Linux guest operating system.)

Configuring Network Heap Size in ESX Server

The amount of memory allocated by default for a network heap depends on the amount of memory configured in the system. The ESX Server network stack allocates a minimum of 64 MB to the network heap to handle network data. More memory is allocated to the network heap if the system is configured with more memory. If the network load requires more than 64 MB of memory, the NIC driver cannot allocate it. When this happens, the driver logs messages in the file /proc/vmware/log indicating that the alloc_skb() call failed. This impacts network performance considerably. You can allocate more memory for the network heap using the esxcfg-advcfg command in the following example.

To read the current size of the network heap, run:

```
# esxcfg-advcfg -j netPktHeapMaxSize
netPktHeapMaxSize = 0
#
```

If the default value of 64 MB is in effect, this command shows the PktHeapMaxSize as 0. If any other value is in effect, the command returns that value.

For example, to set the heap size to 128 MB, run the command:

```
# esxcfg-advcfg -k 128 netPktHeapMaxSize
# esxcfg-advcfg -j netPktHeapMaxSize
netPktHeapMaxSize = 128
#
```

The new value takes effect after a reboot.

Note: Although ESX supports up to 256 iSCSI targets, it can only display up 139 targets. For information on displaying more that 139 targets, see the *ESX Server iSCSI* in the *Troubleshooting* section.

Interrogating the NIC Driver

To get information on the installed NIC driver, enter:

```
esxupdate query --vib-view | grep be2net
```

This is a sample output:

```
[root@blade10]# esxupdate query --vib-view | grep be2net
cross_vmware-esx-drivers-net-be2net_400.2.102.225.12-1.0.4.164009
installed 2010-04-05T11:28:38.540372-07:00
cross_vmware-esx-drivers-net-be2net_400.2.102.200.10-1.0.4.164009
retired 2010-03-18T13:59:02.520994-07:00
```

Configuration

FC and FCoE Driver Configuration

You can configure driver parameters using native ESX tools, the Emulex OneCommand Manager command line interface (CLI) application (for use in non-lockdown mode), or the OneCommand Manager for VMware vCenter application (for use in lockdown mode). This document describes how to configure parameters using native ESX tools. For a more comprehensive description of ESX tools, refer to VMware's public website. If you have further questions, contact a VMware technical support representative. See the *OneCommand Manager Command Line User Manual* for information about the OneCommand Manager application. See the *OneCommand Manager for VMware vCenter User Manual* for information about the OneCommand Manager for VMware vCenter software plugin..

Note: For VMware ESX Server systems, the firewall on the ESX Server must be opened to manage systems remotely using TCP/IP. To enable TCP port #23333, run the following commands:

```
esxcfg-firewall --openPort 23333,tcp,in,onecommand
esxcfg-firewall --openPort 23333,tcp,out,onecommand
```

To verify that the correct port is open, run the following command:

```
esxcfg-firewall -q
```

The TCP port number can be changed. The default is 23333.

Refer to the VMware Server Configuration Guide for more details on how to configure the ESX firewall.

Temporary FC/FCoE Configuration Methods Using Native ESX Tools

There are four ways to configure the driver parameters:

- Permanent (global)
- Permanent (per adapter)
- Temporary (global)
- Temporary (per adapter)

Note: The OneCommand Manager application, version 5.2 also supports all four ways to configure driver parameters. This is the preferred method of setting configuration parameters. Refer to the OneCommand Manager 5.2 User Manual for more information.

Permanent FC/FCoE Configuration Methods Using Native ESX Tools

Permanent configuration requires that the new values be saved in the ESX environment. These changes are considered permanent because they stay in effect across system reboots.

To make changes that impact all adapters in the system (global changes), follow these steps. See "FC/FCoE Driver Configuration Parameters" on page 14 for parameter names and values. Parameter values are in both hexadecimal and decimal.

1. From the Console Operating System (COS) terminal window type:

   ```
   esxcfg-module -s “param=value param2=value...” <driver_name>
   ```

   The <driver_name> is obtained from the `vmkload_mod -l` call. Look for the “lpfc” prefix.

2. Reboot the server. Type:

   ```
   reboot
   ```

Note: VMware does not officially support unloading the driver via vmkload_mod -u. If you must unload the driver, contact VMware technical support.

Note: NPIV port creation and deletion are performed by the VMware vSphere client or Virtual Center service. Refer to the VMware documentation for more information.

Example of Permanent Global Configuration

The following example sets lun_queue_depth (the maximum number of commands that can be sent to a single LUN) to 20 (default is 30) for all Emulex adapters in your system.

1. Locate the parameter lpfc_lun_queue_depth in Table 1 on page 14.
2. Set the permanent value. Type:

   ```
   esxcfg-module -s “lpfc_lun_queue_depth=20” lpfc820
   ```

3. Reboot the server. Type:

   ```
   reboot
   ```

   The new setting is used when the driver reloads.

   To verify the setting type:

   ```
   esxcfg-module -g lpfc820
   ```

Example of Permanent Per-Adapter Configuration

The following example sets lun_queue_depth to 20 (default is 30) for adapter #1.

1. Set the adapter-specific value. Type:

   ```
   esxcfg-module -s “lpfc1_lun_queue_depth=20” lpfc820
   ```

2. Reboot the server. Type:

   ```
   reboot
   ```

   The new setting is used when the driver reloads.

   To verify the setting type:

   ```
   esxcfg-module -g lpfc820
   ```

The following example sets lun_queue_depth to 20 (default is 30) for adapter #1 and lun_queue_depth to 10 (default is 30) for adapter #2.

1. Set the adapter-specific value. Type:

   ```
   esxcfg-module -s “lpfc1_lun_queue_depth=20
   lpfc2_lun_queue_depth=10” lpfc820
   ```

Note: Type the command all on one line without a carriage return.

2. Reboot the server. Type:

   ```
   reboot
   ```

   The new settings are used when the driver reloads.

   To verify the settings type:

   ```
   esxcfg-module -g lpfc820
   ```

Dynamically Adding LUNs and Targets

For instructions on dynamically adding LUNs and targets, refer to the “Using Rescan” section of the VMware SAN Config documentation.

FC/FCoE Driver Configuration Parameters

All adapter-specific parameters have an lpfc*X*_ prefix (where *X* is the driver instance number). For example, setting lpfc0_lun_queue_depth=20 makes 20 the default maximum number of commands that can be sent to a single logical unit (disk) for lpfc instance 0.

Dynamic parameters do not require a system reboot for changes to take effect.

Table 1: FC/FCoE Driver Configuration Parameters

Variable	Default	Min	Max	Dynamic	Comments
lpfc_hba_queue_depth	8192	32	8192	No	Maximum number of FCP commands that can queue to an Emulex adapter. The value cannot exceed what the adapter supports.
lpfc_ack0	0	0=Off	1=On	No	Use ACK0 for class 2.
lpfc_discovery_threads	32	1	64	No	Specifies the maximum number of PLOGI commands that can be outstanding for a discovery.
lpfc_fcp_class	3	2	3	No	FC class for FCP data transmission.
lpfc_fdmi_on	0	0	2	Yes	False (0) if disabled. (1) or (2) if enabled, depending on type of support needed.
lpfc_link_speed	0	0=auto select 1=1 Gb/s 2=2 Gb/s 4=4 Gb/s 8=8 Gb/s		No	Sets link speed. **Note:** Not supported for FCoE.
lpfc_log_verbose	0x0	0x0	0x7fffffff	Yes	Extra activity logging (bit mask).
lpfc_lun_queue_depth	30	1	128	Yes	Default max commands sent to a single logical unit (disk).

Table 1: FC/FCoE Driver Configuration Parameters (Continued)

Variable	Default	Min	Max	Dynamic	Comments
lpfc_max_scsicmpl_time	0	0	60000	Yes	Limits SCSI command completion time (in mS) to control I/O queue depth. The default (0) means the SCSI layer maintains control.
lpfc_scan_down	1	0=Off	1=On	No	Select a method for scanning ALPA to assign a SCSI ID.
lpfc_tgt_queue_depth	8192	10	8192	No	Default maximum number of commands sent to a single target. By default, there is no effective limit at the target level.
lpfc_topology	0	0x0=loop then P2P 0x1=internal loopback 0x2=P2P only 0x4=loop only 0x6=P2P then loop		No	FC link topology. (Defaults to loop. If that fails, the driver attempts to link in point-to-point mode). **Note:** Not supported for FCoE.
lpfc_use_adisc	0	0=Off	1=On	Yes	Send ADISC instead of Port Login (PLOGI) for device discovery or Registered State Change Notification (RSCN).
lpfc_devloss_tmo	10	1	255	Yes	Number of seconds a remote port can drop from the SAN before that port is removed from the driver.
lpfc_use_msi	0	0 = use INTX (min) 1 = use MSI 2 = use MSI-X (max)		No	Selects which interrupt mode to use. By default, the driver uses INTX. VMware guidance is to use MSI-X, but MSI is available.
lpfc_fcp_wq_count	4	1	31	No	Configures the number of fast-path work queues used by the host and port.
lpfc_fcp_eq_count	4	1	7	No	Configures the number of fast-path event queues used by the host and port.
lpfc_sg_seg_count	64	64	256	No	Configures the maximum number of scatter-gather elements the driver accepts in a single SCSI command.

Table 1: FC/FCoE Driver Configuration Parameters (Continued)

Variable	Default	Min	Max	Dynamic	Comments
lpfc_iocb_cnt	1	1	5	No	IOCBs allocated for ELS, CT, ABTS in 1024 increments, Default is 1.

Creating a Fibre Channel Remote Boot Disk

For instructions on creating a Fibre Channel remote boot disk, refer to the VMware SAN configuration documentation, “Chapter 6, Using Boot from SAN with ESX Server Systems.”

Managing ESX/ESXi Server Through the CIM Interface

This manual also describes how OneCommand Manager can be configured to manage VMware ESX and ESXi servers through the CIM interface. Please note that the management of adapters in the VMware ESX/ESXi hosts through the CIM interface is enabled only for the OneCommand Manager applications running on the Windows environment.

Installing the Emulex CIM Provider

To install the Emulex CIM provider, use the esxupdate utility provided by VMware in ESX and ESXi platforms. For information on the esxupdate procedure, refer to “esxupdate Procedure” on page 7 for more details.

CIM Provider

The Emulex CIM Provider is available as a core kit rpm in ESX platforms and as an offline bundle in ESXi platforms.

To install the CIM Provider core kit, which is only for ESX, execute the following command in the command prompt of the ESX host:

```
#rpm -ivh <CIM Provider rpm>
```

where <CIM Provider rpm> is the released CIM Provider rpm.

For example,

```
elxocmcore-esx40-5.1.32.2-1.x86_64.rpm
```

To install the CIM Provider offline bundle, which is only for ESXi, execute the following command in the command prompt of the ESXi host:

```
#esxupdate --maintenancemode --nosigcheck update --bundle <offline-
   bundle.zip>
```

where <offline-bundle.zip> is the offline bundle for the Emulex CIM Provider.

For example,

```
ELX-ESX-4.1.0-emulex-cim-provider-3.2.16.1-offline_bundle-311859.zip
```

Note: You must reboot the system for the changes to be effective.

For more information about the ESX patch management activities, see the document located at http://www.vmware.com/pdf/vsphere4/r41/vsp_41_esxupdate.pdf

After the reboot is completed, verify that the drivers and the CIM Provider are correctly installed by typing the following commands

```
#esxupdate --vib-view query | grep be2
#esxupdate --vib-view query | grep lpfc
#esxupdate --vib-view query | grep emu
```

For additional configuration information, refer to “Managing Devices using CIM” on page 25 for more details.

Working with VPorts (Virtual Ports)

Creating, Deleting and Displaying VPorts

The Emulex driver for VMware supports NPIV by default. The only management API for creating and deleting a VPort and creating an NPIV-enabled virtual machine comes from ESX. VPorts in the driver discover the fabric just like physical ports do, and are subject to the same SAN delays. As the number of VPorts increases, the amount of time it takes to complete remote port discovery increases. This is because the VPorts are created sequentially and each VPort executes discovery synchronously. If your NPIV-enabled virtual machines power-on automatically, powering on could take longer than usual. This is normal for NPIV virtual machines.

Note: Ensure you are using the latest recommended firmware for VPort functionality. Check the Emulex website for the latest firmware.

Note: Loop devices and NPIV are not supported on the same port at the same time. If you are running a loop topology and you create a VPort, the VPort’s link state is *offline*. VMware ESX supports only fabric mode.

Note: You can create VPorts only on 4 Gb/s, 8 Gb/s, and OneConnect adapters. You cannot create VPorts on 1 Gb/s or 2 Gb/s adapters.

Note: The OneCommand Manager application sees all VPorts created by the driver, but the application has read-only access to them.

NIC Driver Configuration

Configuring NIC Driver Options

The following table lists the user configurable NIC driver options. It includes a description of the parameter and its default value.

Parameter	Default Value	Description
heap_initial	**32 MB**	**The size of the memory heap, in bytes, that should be initially allocated for the driver.**
heap max	**38 MB**	**The maximum possible size to which the driver heap is allowed to grow.**

The following command line shows how to load the diver with initial heap size as 40 MB:

```
# vmkload_mod be2net heap_initial=41943040
```

To configure the NIC driver to load with this value as the initial heap size after each reboot, run the following command and reboot the system:

```
# esxcfg-module -s "heap_initial=41943040" be2net
```

Performance Tuning

Network driver performance tuning improves performance of the network and the TCP Offload driver.The OneConnect UCNA is an x8, Generation 2 ("Gen 2", or Gen2) PCI-Express (PCIe) device and requires substantial system-memory bandwidth to support
10-Gb/s data streams.

Using vmxnet Emulation, and Enabling Jumbo Frames and TSO

Note: You can configure TSO (**T**CP **S**egmentation **O**ffload) and jumbo frames using the vSphere client.

The OneConnect UCNA supports jumbo frames and TSO, both of which are necessary to achieve optimal performance with the OneConnect UCNA. Also, the use of the vmxnet NIC emulator can provide a significant performance boost. These features are not enabled by default in ESX Server. To enable these features:

1. Log into the console operating system.
2. Locate the .vmx file in the path

   `/vmfs/volumes/*/<VM-NAME>/VM-NAME>.vmx`

   where <*VM-NAME*> is the name of the VM.
3. For each VM, edit this file and add the following line for the NIC driver interface:

   `ethernet0.features="15"`
4. To enable vmxnet emulation, add the following line for the NIC driver interface:

   `ethernet0.virtualDev="vmxnet"`
5. Restart the VMs.

Steps 1 through 5 assume that eth0 is the interface added to the VM from the OneConnect Network.

Note: The use of vmx NIC emulation requires VMware Tools to be installed in the guest operating systems. For information on installing VMware Tools in a Linux or Windows guest operating system, refer to the VMware ESX Server 4.1 documentation.

Configuring a Virtual Switch to Use Jumbo Frames

To use jumbo frames, you must increase the MTU (Maximum Transmission Unit) size in the vSwitch and also in the guest operating system. The NIC driver supports Maximum Transmission Units (MTUs) between 64 bytes and 9000 bytes. For the best combination of performance and resource use, set the MTU to the maximum supported by the driver, which is 9000 bytes. This requires the MTU to be changed in the virtual switch as well as the guest operating systems..

Note: You can configure TSO (**T**CP **S**egmentation **O**ffload) and jumbo frames using the vSphere client.

Setting the MTU Size in the vSwitch

To change the MTU to 9000, run the following command for each switch in the console operating system:

```
esxcfg-vswitch vSwitch<N> -m 9000
```

where <*N*> is the number of the switch.

Setting the MTU Size for a Linux Guest Operating System

To set the MTU of the NIC driver interface in each Linux Guest operating system to 9000, run the following command:

```
ifconfig eth<N> mtu 9000
```

where <*N*> is the number of the Ethernet interface on which you are working.

Setting the MTU Size for a Windows Guest Operating System

To set the MTU in each Windows guest operating system:

1. Go to the **Start** menu and select **Control Panel** > **System**.
2. Select the **Hardware** tab and open **Device Manager**.
3. Expand the **Network Adapters** heading.
4. Right click on the **NIC**, and select **Properties**.
5. Select the **Advanced** tab and select jumbo (e1000 emulation) or set the MTU value (VMware PCI Adapter emulation).

iSCSI Driver Configuration

Configuring iSCSI Driver Options

The following table lists the user configurable iSCSI driver options on ESX Server 4.1. It includes a description of the parameters, default values and the limits within which they can be configured.

Note: If the value given for a parameter is outside the supported range (MIN and MAX values), then the driver will log an error in the Event Log and continue to load by taking the default value of the parameter.

Parameter	Default Value	Minimum Value	Maximum Value	Description
LDTO	20 seconds	0 seconds	30 seconds	Link Down Timeout, in seconds. This determines the amount of time the initiator driver will wait for the controller's physical link to become available before reporting that the LUNs are unavailable to the operating system.
ETO 30	30 seconds	0 seconds (If set between 0 - 19, driver will assume the value of 20 internally. No modifications will be seen in registry.)	30 seconds	Extended Timeout in Seconds. This determines the amount of time the initiator driver will wait for the target to become available once it has lost connection to the target during an IO operation.
im_policy	2	0	4	Controls the rate of interrupts for the UCNA. For more information, see ***Interrupt Moderation Policy Settings***.
large I/O	128	128	512	Maximum transfer size in a single I/O request in kilobytes. By default, the iSCSI driver supports a maximum of 128 KB of data in a single I/O request. This option can be used to enable support for 512 KB of data in a single I/O request.

The following command line shows how to configure the driver with LDTO value as 25 secs:

```
# vmkload_mod be2iscsi ldto=25
```

To configure ESX Server to load be2iscsi driver with this value after each reboot, run the following commands and reboot the system:

```
# esxcfg-module -s "ldto=25" be2iscsi
# /usr/sbin/esxcfg-boot -r
# reboot
```

The im_policy (Interrupt Moderation policy) parameter configures the OneConnect driver to use different settings for Interrupt Moderation. An im_policy value of 1 achieves the highest interrupt rate, whereas the value 4 provides the least interrupt rate. The default value is 2. An im_policy of 0 turns off the Interrupt Moderation algorithm in the driver.

The large_io option can be used to modify the maximum transfer size in a single SCSI command. By default, the OneConnect iSCSI driver in ESX supports up to 128KB and 32 Scatter Gather entries in a single SCSI command. If applications issue I/O requests that are larger than 128KB or need more than 32 Scatter Gather entries, the request will be split into multiple requests by the driver. By specifying large_io=512; the iSCSI driver can support up to 512KB of data and a total of 128 Scatter Gather entries in a single SCSI command.

Note that by setting the option to 512, the amount of physical memory consumed by the driver increases. Also, though intermediate values between 64 and 512 will be accepted, the memory used by the driver will be the same as what will be used for large_io=512.

To set the large_io parameter in ESX, type the following commands:

```
esxcfg-module -s large_io=512 be2iscsi --> to set the parameter
esxcfg-module -g be2iscsi --> to view the parameter value
esxcfg-module -i be2iscsi --> to view the options
```

Even though the VMware operating system can be tuned to accept larger I/O sizes from guest operating systems, the guest operating systems will also often need to be tuned to create those larger I/Os. For example, a Windows 2003, 32-bit guest will by default have a maximum transfer size of 64KB, even if the VMware kernel is tuned to allow 512KB IO transfers. You will need to modify the guest registry in order to achieve the maximum transfer rate set in the VMware kernel.

To do this, use the registry editor to add or modify the following entry to change the maximum transfer size for the Windows guest:

```
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Symmpi\Parameters\Device\MaximumSGList
```

The formula used to calculate the proper value for MaximumSGList is:

For a 32-bit Windows guest use the following formula:

```
MaximumSGList = ((Maximum Transfer Size) / 4) + 1
```

For a 64-bit Windows guest use the following formula:

```
MaximumSGList = ((Maximum Transfer Size) / 8) + 1
```

For example: to allow a 256 Kbyte transfer size on a 32-bit guest, this would be the formula to use: 256 / 4 = 64 + 1 = 65 (decimal) or 0x41(hexadecimal).

The maximum value allowed for MaximumSGList is 255 or 0xFF. For the particular value of 0xFF, the internal value passed to Windows is increased to 0x101, allowing support for a full 1 Mbyte transfer (2 Mbytes for 64-bit).

The MaximumSGList is 129 for a 512K transfer.

Other guest OS's may also need to be tuned similarly. Consult the tuning guides that accompany those operating systems.

Interrupt Moderation Policy Settings

Interrupt Moderation Policy settings control the rate of interrupts for OneConnect hardware. By default, the driver implements an Interrupt Moderation scheme that is based on the I/O load and the interrupt rate. The default setting for Interrupt Moderation Policy tries to vary the interrupt rate between 3500 to 10000 interrupts per second. In addition, the OneConnect driver allows other configuration settings which are listed in the following table:

Setting	Parameter	Description
Disabled	**im_policy=0**	**Interrupt Moderation algorithm is turned off in the driver.**
Aggressive	**im_policy=1**	**Achieves the highest interrupt rate among all available settings.**
Moderate	**im_policy=2**	**Is also the default value.**
Conservative	**im_policy=3**	**Achieves a lower interrupt rate than Moderate.**
Very Conservative	**im_policy=4**	**Achieves the minimum interrupt rate among all available settings.**

While the default setting of Moderate may work for most configurations, there are instances when the setting may need to be altered. Changing the Interrupt Moderation Policy setting should be based on the initiator system configuration, the number of iSCSI targets that will be connected, the I/O load and on the throughput and latency offered by these iSCSI targets.

On systems capable of sustaining a higher interrupt rate and when the number of targets that will be connected is less (up to 8), the more Aggressive setting will result in lower latency and higher values of I/O operations per second (IOPs). But the higher interrupt rate could also result in system stalls and freezes, especially during higher values of queue depth and smaller sized I/O requests.

Though on a configuration that involves a large number of iSCSI targets (more than 32 or 64) and higher values of queue depth, the default setting may prove to be too aggressive and the Interrupt Moderation setting may need to be changed to Conservative or Very Conservative. Though this will increase latency of an I/O request, the lower interrupt rate may allow the system to be functional under a high load.

iSCSI Error Handling

The goal of iSCSI error handling is to be tolerant of link level and/or target level failures up to configured timeout values so that I/O errors are not seen by the application or operating system. The error handling is triggered under the following conditions:

- Loss of immediate link to the initiator (e.g., cable disconnect/port failure)

  The OneConnect firmware detects and notifies the driver of a loss of the link. When this happens, the driver will queue the I/O requests internally up to a configured timeout periodso that the operating system does not see I/O errors. This timeout is known as Link Down Timeout (LDTO).

- Loss of connection to the target due to target and/or network disconnection at the target.

  If the driver has I/O requests pending with the target and the target becomes unavailable (due to target going down/failing over or network issues at the target), the driver queues up the I/O request internally up to a configured timeout period. This timeout is known as Extended Timeout (ETO).

When the configured threshold for LDTO and ETO is reached and the initiator is still unable to connect to the target, the driver fails all I/O requests. At this point, I/O errors will be seen by the application and operating system.

Note: Following a link up, switch ports can take a long time to initialize and go to forwarding state. Because of this, additional time should be added to the ETO and LDTO settings to eliminate I/O disruption and/or target unavailability. If the switch port is connected to a single host, then PortFast mode can be enabled on the switch port to eliminate delays in transitioning to forwarding state.

Configuring LDTO and ETO on ESX Server

The following table lists the default values of LDTO and ETO on ESX Server and the limits within which they can be configured:

Value	Default	Minimum	Maximum
LDTO	**20 seconds**	**0 seconds**	**30 seconds**
ETO	**30 seconds**	**0 seconds**	**30 seconds**

Note: If the value of ETO is set to a number between 0 and 19, the driver will assume the value to 20 secs internally. You will not see any modification to the registry.

LDTO and ETO values are configurable during insmod time. The ETO value specified during insmod is the default ETO value that is applied to all targets.

The following command line shows how to configure the driver with LDTO value as 25 secs:

```
# vmkload_mod be2iscsi ldto=25
```

To configure ESX Server to load the iSCSI driver with this value after each reboot, run the following commands and reboot the system:

```
# esxcfg-module -s "ldto=25" be2iscsi
# /usr/sbin/esxcfg-boot -r
# reboot
```

Multipath I/O Support

This section describes the installation and login processes for multipath I/O support.

Configuring and Enabling Support for ESX MPIO on Non-boot Targets

To configure and enable support for ESX MPIO on non-boot targets:

1. Connect your configuration for multipath.
2. Log into your targets with all paths using vSphere Client or iSCSISelect. For more information, see *Logging Into Targets Using vSphere Client.* For information about using using iSCSISelect, see the *Emulex Boot Manual*.

Configuring and Enabling Support for ESX MPIO on BootTargets

To configure and enable support for ESX MPIO on boot targets:

1. Connect your configuration for multipath. Multipath can be configured before or after installation.

2. Log into your targets with all paths using vSphere Client or iSCSISelect. For more information, see *Logging Into Targets Using vSphere Client.* For information about using using iSCSISelect, see the *Emulex Boot Manual*.

Logging into Targets Using vSphere Client

To log into targets using the vSphere Client, follow these steps:

1. Log into the server that you would like to configure from the vSphere Client and select the **Configuration** tab.
2. In the Hardware section, select the **Storage Adapters** link.
3. Select the OneConnect host adapter in the **Storage Adapters** list.
4. Select the initiator port, and then click **Properties**.
5. From the iSCSI Initiator Properties screen, click the **Dynamic Discovery** tab.
6. Click **Add** to display the **Add Send Target Server** menu.
7. Type in the IP address of the first target portal and click **OK**.

   The initiator finds the target machines.
8. Click the **Static Discovery** tab to find all target portals.
9. Click **Close**.
10. A dialog box indicates that a rescan is needed. Click **Yes**.

    The configured LUNs are displayed.
11. Repeat the steps to log into the other target portal to set up MPIO.
12. To check that both paths are connected to the same LUN, follow these steps:
    a. Select the LUN and right-click.
    b. Click **Manage Paths**. Multipaths on the LUN are displayed. For example:

Error Handling Under Multipath (MPIO) and Cluster Configurations

In an MPIO or cluster configuration, fault tolerant software is present on the system that makes the iSCSI driver error handling redundant. These configurations also require that I/O errors be reported as soon as they are detected so that the software can failover to an alternate path or an alternative node as quickly as possible.

When the iSCSIdriver is run under these configurations, the error handling implemented in the iSCSI driver must be turned off by setting the default value of LDTO and ETO to 0. The changes will take effect during the next driver load.

Managing Devices using CIM

VMware on the Visor-based ESX platforms uses the Common Interface Model (CIM) as the only standard management mechanism for device management. The OneCommand Manager application uses the standard CIM interfaces to manage the adapters in the ESX COS and Visor environments. The OneCommand Manager application supports the CIM-based device and adapter management in addition to the existing adapter management functionality around its proprietary management stack along with the standard HBAAPI interface.

Refer to the OneCommand Manager Application User Manual for more information.

Troubleshooting

Introduction

There are several circumstances in which your system may operate in an unexpected manner. The Troubleshooting section explains many of these circumstances and offers one or more workarounds for each situation.

Troubleshooting the FC/FCoE Driver

General Situations

Table 2. General Driver Situations

Situation	Resolution
Port link fails to come up.	If an FC link fails to come up, verify that an 8 Gb/s adapter is not attempting to connect to a 1 Gb/s device. Only 2, 4 and 8 Gb/s devices are supported on 8 Gb/s adapters. For LP21000 adapters, ensure the adapter is not in maintenance mode and that it is not running the manufacturing firmware. For the OCe10100 family of adapters, ensure that the fabric port is enabled.
The Emulex driver is not loaded and all paths are down.	Use lspci to determine if the Emulex ports are being properly identified. If not, find out if the driver iso was correctly installed. You must have the correct driver for the installed adapter because the device PCI IDs are installed with the driver package. Examine the /var/log/vmkernel file for lpfc820 log messages indicating an error. In this case contact Emulex support.
lpfc driver fails to recognize an adapter and logs "*unknown IOCB*" messages in the system log during driver load. The adapter is running outdated firmware.	Upgrade the adapter firmware to the minimum supported revision (or newer) listed in the installation guide.
System panics when booted with a failed adapter installed.	Remove the failed adapter and reboot.

lpfc Log Messages

Introduction

Log messages have traditionally been organized into logical groups based on code functionality in the FC driver. With the introduction of OneConnect UCNAs by Emulex, that grouping is modified to account for new behaviors. The traditional grouping is maintained, but new messages no longer group together nicely.

The messages provided in this section are unmaskable error conditions. They are automatically added to the system console log.

You can examine the /var/log/vmkernel file to see any of these messages. If you have concerns, the best policy is to execute a vm-support dump and push it to the VMware/Emulex support staff.

Log messages are organized into logical groups based on code functionality within the Fibre Channel driver. Each group consists of a block of 100 log message numbers. Most groups require a single block of 100 message numbers, however some groups (INIT, FCP) require two blocks.

Table 3, the Message Log table, shows the groups and defines the associated number ranges.

Table 3: Message Log Table

LOG Message Verbose Mask Definition	Verbose Bit	Verbose Description
LOG_ELS	0x1	ELS events
LOG_DISCOVERY	0x2	Link discovery events
LOG_MBOX	0x4	Mailbox events
LOG_INIT	0x8	Initialization events
LOG_LINK_EVENT	0x10	Link events
LOG_FCP	0x40	FCP traffic history
LOG_NODE	0x80	Node table events
LOG_TEMP	0x100	Temperature sensor events
LOG_MISC	0x400	Miscellaneous and FCoE events
LOG_SLI	0x800	SLI events
LOG_FCP_ERRORLOG_	0x1000	Selective FCP events
LOG_LIBDFC	0x2000	IOCTL events
LOG_VPORT	0x4000	NPIV events
LOF_EVENT	0x10000	IOCTL event
LOG_DAEMON	0x20000	IOCTL Daemon events
LOG_FIP	0x40000	FIP event
LOG_PROC	0x80000	Procfs events
LOG_ALL_MSG	0xffffffff	Log all messages

Message Log Example

The following is an example of a LOG message:

```
Jul 2 04:23:34 daffy kernel: lpfc 0000:03:06.0: 0:1305 Link Down
Event x2f2 received Data: x2f2 x20 x110
```

In the above LOG message:

- lpfc 0000:03:06.0: identifies the identifies the PCI location of the particular lpfc hw port.
- 0: identifies Emulex HBA0.
- 1305 identifies the LOG message number.

Note: If the word 'Data:' is present in a LOG message, any information to the right of 'Data:' is intended for Emulex technical support/engineering use only.

Note: Unless otherwise noted in the ACTION: attribute, report these errors to Technical Support. Emulex requests that when reporting occurrences of these error messages, you provide a tarball of all vmkernel files in /var/log.

ELS Events (0100 - 0199)

elx_mes0100: FLOGI failure Status:<status>/<extended_status> TMO:<timeout>

DESCRIPTION: An ELS FLOGI command that was sent to the fabric failed.
DATA: (1) ulpStatus, (2) ulpWord[4], (3) ulpTimeout
ACTION: This error could indicate a fabric configuration error or internal driver issue. If problems persist report these errors to Technical Support.

elx_mes0111: Dropping received ELS cmd

DESCRIPTION: The driver decided to drop an ELS Response ring entry.
DATA: (1) ulpStatus, (2) ulpWord[4], (3) ulpTimeout
ACTION: This error could indicate a software driver or firmware problem. If problems persist report these errors to Technical Support.

elx_mes0113: An FLOGI ELS command <elsCmd> was received from DID <did> in Loop Mode

DESCRIPTION: While in Loop Mode an unknown or unsupported ELS command was received.
DATA: None
ACTION: Check device DID.

elx_mes0115: Unknown ELS command <elsCmd> received from N_Port <did>

DESCRIPTION: Received an unsupported ELS command from a remote N_Port.
DATA: None
ACTION: Check remote N_Port for potential problem.

elx_mes0122 FDISC Failed (x%x). Fabric Detected Bad WWN

DESCRIPTION: Driver's FDISC failed. Switch reported a bad WWN in FLOGI request
DATA:
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes0124 Retry illegal cmd x%x retry:x%x delay:x%x

DESCRIPTION: Port rejected ELS command as illegal. Driver retrying

DATA:
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes0125: FDISC Failed (x%x). Fabric out of resources

DESCRIPTION: The fabric rejected an FDISC because the switch can not support any more Virtual ports.
DATA: None
ACTION: Reconfigure the switch to support more NPIV logins. If problem persists, contact Technical Support.

elx_mes0126: FDISC failed (ulpStatus/ulpWord[4])\n

DESCRIPTION: The ELS FDISC command has failed.
DATA: None
ACTION: Check the port and switch configuration.

elx_mes0127: ELS timeout

DESCRIPTION: An ELS IOCB command was posted to a ring and did not complete within ULP timeout seconds.
DATA: (1) elscmd, (2) remote_id, (3) ulpcommand, (4) ulpIoTag
ACTION: If no ELS command is going through the adapter, reboot the system; If problem persists, contact Technical Support.

elx_mes0133: PLOGI: no memory for reg_login

DESCRIPTION: Memory allocation error.
DATA: (1) nlp_DID, (2) nlp_state, (3) nlp_flag, (4) nlp_rpi
ACTION: Memory allocation error. Check system resources. Unload unused modules.

elx_mes0134: PLOGI: cannot issue reg_login

DESCRIPTION: The ELS PLOGI mailbox command has failed.
DATA: (1) nlp_DID, (2) nlp_state, (3) nlp_flag, (4) nlp_rpi
ACTION: Check the port and switch configuration.

elx_mes0135: cannot format reg_login

DESCRIPTION: Could not allocate an RPI or DMA buffer for the mailbox command.
DATA: (1) nlp_DID, (2) nlp_state, (3) nlp_flag, (4) nlp_rpi
ACTION: None required.

elx_mes0136: PLOGI completes to N_Port <DID> completion

DESCRIPTION: A PLOGI has completed for which there is no NDLP.
DATA: (1) ulpStatus, (2) ulpWord[4]
ACTION: None required.

elx_mes0137: No retry ELS command <ELS_CMD> to remote

DESCRIPTION:
DATA: (1) ulpStatus, (2) ulpWord[4]
ACTION: None required.

elx_mes0138: ELS rsp: Cannot issue reg_login for <DID>

DESCRIPTION: REG_LOGIN mailbox command failed.

DATA: (1) nlp_DID, (2) nlp_state, (3) nlp_flag, (4) nlp_rpi
ACTION: None required.

elx_mes0140: PLOGI Reject: invalid nname

DESCRIPTION: Invalid node WWN provided.
DATA: None
ACTION: None required.

elx_mes0141: PLOGI Reject: invalid pname

DESCRIPTION: Invalid port WWN provided.
DATA: None
ACTION: None required.

elx_mes0142: PLOGI RSP: Invalid WWN

DESCRIPTION: The PLOGI sent to the port by a remote port had an invalid WWN.
DATA: None
ACTION: None required.

elx_mes0144: Not a valid WCQE code: <Completion Code>

DESCRIPTION: The completion queue handler detected an invalid type.
DATA: None
ACTION: None required.

elx_mes0147: Failed to allocate memory for RSCN event

DESCRIPTION: Memory could not be allocated to send the RSCN event to the management application
DATA: None
ACTION: None required.

elx_mes0148: Failed to allocate memory for LOGO event

DESCRIPTION: Memory could not be allocated to send the LOGO event to the FC transport.
DATA: None
ACTION: None required.

elx_mes0150 SLI4 Adapter Hardware Error Data: x%x x%x

DESCRIPTION: Driver detected a hardware error in an SLI4 capable port.
DATA: (1) error 1 (2) error 2
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

Link Discovery Events (0200 - 0299)

elx_mes0200: CONFIG_LINK bad hba state <hba_state>

DESCRIPTION: A CONFIG_LINK mbox command completed and the driver was not in the right state.
DATA: None
ACTION: Software driver error. If this problem persists, report these errors to Technical Support.

elx_mes0203: Devloss timeout on WWPN <address> N_Port <nlp_DID>

DESCRIPTION: A remote N_Port that was discovered by the driver disappeared for more than

lpfc_devloss_tmo seconds.
DATA: (1) nlp_flag, (2) nlp_state, (3) nlp_rpi
ACTION: If the device generating this message is not a target to which the adapter is connected, this error does not affect the data integrity of the I/O between the adapter and the attached storage and can be ignored.

elx_mes0206: Device discovery completion error

DESCRIPTION: This indicates that an uncorrectable error was encountered during device (re)discovery after a link up. Fibre Channel devices are not accessible if this message is displayed.
DATA: None
ACTION: Reboot the system. If the problem persists, report the error to Technical Support. Run with verbose mode on for more details.

elx_mes0207: Device <DID> (<WWN>) sent invalid service parameters. Ignoring device.

DESCRIPTION: Invalid service parameters were received from DID. Ignoring this remote port.
DATA: DID, WWN
ACTION: Verify the remote port's configuration. If the problem persists, report the error to Technical Support. Run with verbose mode on for more details.

elx_mes0222: Initial FLOG/FDISKI timeout

DESCRIPTION: The driver sent the initial FLOGI or FDISK to the fabric and never got a response back.
DATA: None
ACTION: Check Fabric configuration. The driver recovers from this and continues with device discovery.

elx_mes0223: Timeout while waiting for NameServer login

DESCRIPTION: Our login request to the NameServer was not acknowledged within RATOV.
DATA: None
ACTION: Check the fabric configuration. The driver recovers from this and continues with device discovery.

elx_mes0224: NameServer Query timeout

DESCRIPTION: Node authentication timeout, node Discovery timeout. A NameServer Query to the Fabric or discovery of reported remote N_Ports is not acknowledged within R_A_TOV.
DATA: (1) fc_ns_retry, (2) fc_max_ns_retry
ACTION: Check Fabric configuration. The driver recovers from this and continues with device discovery.

elx_mes0227: Node Authentication timeout

DESCRIPTION: The driver has lost track of what N_Ports are being authenticated.
DATA: None
ACTION: None required. The driver should recover from this event.

elx_mes0228: CLEAR LA timeout

DESCRIPTION: The driver issued a CLEAR_LA that never completed.
DATA: None
ACTION: None required. The driver should recover from this event.

elx_mes0230: Unexpected timeout, hba linkstate <link_state>

DESCRIPTION: Discovery has timed out and the adapter state is not ready.
DATA: None

ACTION: None required.

elx_mes0231: RSCN timeout

DESCRIPTION: The driver has lost track of what N_Ports have RSCNs pending.
DATA: (1) fc_ns_retry, (2) lpfc_max_ns_retry
ACTION: None required. The driver should recover from this event.

elx_mes0233: Nodelist not empty

DESCRIPTION: Driver unloaded or hotplug detected a node still in use.
DATA: None
ACTION: None required.

elx_mes0246: RegLogin failed

DESCRIPTION: The firmware returned a failure for the specified RegLogin.
DATA: (1) Did, (2) mbxStatus, (3) hbaState
ACTION: This message indicates that the firmware could not do RegLogin for the specified Did. There may be a limitation on how many nodes an adapter can see.

elx_mes0249: Cannot issue Register Fabric login: Err <err>

DESCRIPTION: Could not issue the fabric reg login; the err value is unique for each possible failure.
DATA: None
ACTION: None required.

elx_mes0251: NameServer login: no memory

DESCRIPTION: Could not allocate memory for the NDLP structure.
DATA: None
ACTION: None required.

elx_mes0252: Cannot issue NameServer login

DESCRIPTION: Could not issue an ELS PLOGI to the nameserver DID.
DATA: None
ACTION: Check the port connection and switch configuration.

elx_mes0253: Register VPI: Can’t send mbox

DESCRIPTION: Could not issue the REG_LOGIN command for this VPort.
DATA: None
ACTION: None required.

elx_mes0254: Register VPI: no memory" goto mbox_err_exit

DESCRIPTION: Could not allocate memory for the REG_LOGIN mailbox command.
DATA: None
ACTION: None required.

elx_mes0255: Issue FDISC: no IOCB

DESCRIPTION: All of the pre-allocated IOCBs are in use.
DATA: None
ACTION: None required.

elx_mes0256: Issue FDISC: Cannot send IOCB

DESCRIPTION: Unable to send the fabric IOCB.
DATA: None
ACTION: Check the switch configuration.

elx_mes0257: GID_FT Query error: <ulpStatus> <fc_ns_retry>

DESCRIPTION: The GID_FT CT request for the nameserver has failed.
DATA: None
ACTION: Check the switch configuration.

elx_mes0258: Register Fabric login error: <mbxStatus>

DESCRIPTION: The REG_LOGIN for the fabric has failed.
DATA: None
ACTION: Check the port and switch configuration.

elx_mes0259: No NPIVFabric support

DESCRIPTION: The switch to which the port is connected does not support NPIV.
DATA: None
ACTION: Check the switch configuration.

elx_mes0260: Register NameServer error: <mbxStatus>

DESCRIPTION: The REG_LOGIN mailbox command has failed for the nameserver.
DATA: None
ACTION: Check the switch configuration.

elx_mes0261: Cannot Register NameServer login

DESCRIPTION: Either a memory allocation issue or an invalid parameter was sent to the REG_LOGIN.
DATA: None
ACTION: At least one message (0142 0121 0133 0134 0135) should precede this message.

elx_mes0262: No NPIV Fabric support

DESCRIPTION: The switch to which the port is connected does not support NPIV.
DATA: None
ACTION: Check the switch configuration.

elx_mes0263: Discovery Mailbox error: state: <port_state> : <sparam_mbox> <cfglink_mbox>

DESCRIPTION: Either the driver could not allocate resources or it could not send sparam_mbox or cfglink_mbox.
DATA: (1) address of sparam_mbox command, (2) address of cfglink_mbox command.
ACTION: Attempt to unload and reload the driver when it is convenient.

elx_mes0264: No NPIV Fabric support

DESCRIPTION: The switch to which the port is connected does not support NPIV.
DATA: None
ACTION: Check the switch configuration.

elx_mes0266: Issue NameServer Req <cmdcode> err <rc> Data: <fc_flag> <fc_rscn_id_cnt>

DESCRIPTION: The driver was not able to send the nameserver CT command.

DATA: (1) VPorts fc_flag, (2) VPorts fc_rscn_id_cnt
ACTION: Check the switch and port configurations.

elx_mes0267: NameServer GFF Rsp "<did> Error (<ulpStatus> <un.ulpWord[4]>) Data: <fc_flag> <fc_rscn_id_cnt>

DESCRIPTION: The nameServer GFF CT request failed.
DATA: (1) VPorts fc_flag, (2) VPorts fc_rscn_id_cnt
ACTION: Check the switch and port configurations.

elx_mes0268: NS cmd <cmdcode> Error (<ulpStatus> <un.ulpWord[4]>)

DESCRIPTION: The nameServer CT request failed.
DATA: None.
ACTION: Check the switch and port configurations.

elx_mes0271: Illegal State Transition: node <nlp_DID> event <evt>, state <nlp_state> Data:<nlp_rpi> <nlp_flag>

DESCRIPTION: The current node state does not have a handler for this event.
DATA: (1) nlp_rpi, (2) nlp_flag
ACTION: Verify that all targets are still visible to the SCSI mid-layer.

elx_mes0272: Illegal State Transition: node <nlp_DID> event <evt>, state <nlp_state> Data: <nlp_rpi> <nlp_flag>

DESCRIPTION: The driver is completing a PLOGI but do not have the rcv_plogi flag set.
DATA: (1) nlp_rpi, (2) nlp_flag
ACTION: Verify that all targets are still visible to the SCSI mid-layer.

elx_mes0273: Unexpected discovery timeout,vport State <port_state>

DESCRIPTION: The discovery process has timed out.
DATA: None
ACTION: Ensure all targets are visible.

elx_mes0282: did:x%x ndlp:x%pusgmap:x%x refcnt:%d, ndlp->nlp_DID, (void *)ndlp, lpfc_init.c-ndlp->nlp_usg_map,

DESCRIPTION: Driver clean-up has found a node that is still on the node list during driver unload or PCI hotplug removal.
DATA: None.
ACTION: None required.

elx_mes0283: Failed to allocate mbox cmd memory

DESCRIPTION: Mailbox allocation error.
DATA: None
ACTION: None required.

elx_mes0285: Allocated DMA memory size <alloclen> is less than the requested DMA memorysize <reqlen>

DESCRIPTION: Memory allocation was truncated.
DATA: None
ACTION: None required.

elx_mes0286: lpfc_nlp_state_cleanup failed to allocate statistical data buffer <nlp_DID>

DESCRIPTION: Memory allocation failed for node's statistical data.
DATA: None
ACTION: None required.

elx_mes0287: lpfc_alloc_bucket failed to allocate statistical data buffer <nlp_DID>

DESCRIPTION: Memory allocation failed for node's statistical data.
DATA: None
ACTION: None required.

elx_mes0288: Unknown FCoE event type <event_type> event tag <event_tag>

DESCRIPTION: The firmware has detected an unknown FCoE event.
DATA: None
ACTION: Check the FCoE switch configuration and the adapter DCBX mode.

elx_mes0289: Issue Register VFI failed: Err <rc>

DESCRIPTION: The driver could not register the Virtual Fabric Index for the FCFI.
DATA: None
ACTION: Check the switch and port configurations.

elx_mes0290: The SLI4 DCBX asynchronous event is not handled yet

DESCRIPTION: The SLI-4 DCBX asynchronous event is not handled yet.
DATA: None
ACTION: None required.

elx_mes0291: Allocated DMA memory size <alloc_len> is less than the requested DMA memorysize <req_len>

DESCRIPTION: The asynchronous DCBX events are not handled in the driver.
DATA: None
ACTION: Check the switch configuration.

elx_mes0293: PM resume failed to start workerthread: error=<error>

DESCRIPTION: The PCI resume (hotplug) could not start the worker thread for the driver.
DATA: None
ACTION: Unload and reload the driver.

elx_mes0294: PM resume Failed to enable interrupt

DESCRIPTION: The PCI resume (hotplug) could not get an interrupt vector.
DATA: None
ACTION: Unload and reload the driver.

elx_mes0297:invalid device group <pci_dev_grp>

DESCRIPTION: While unloading the driver, the driver detect a PCI device that it should not have claimed.
DATA: None
ACTION: None required.

elx_mes0299: Invalid SLI revision <sli_rev>

DESCRIPTION: While processing a host attention or unrecoverable error, the driver detected an invalid

SLI revision.
DATA: None
ACTION: None required.

Mailbox Events (0300 - 0339)

elx_mes0300: LATT: Cannot issue READ_LA: Data: <rc>

DESCRIPTION: The link attention handler could not issue a READ_LA mailbox command.
DATA: None
ACTION: None required.

elx_mes0303: Ring <ringno> handler: portRspPut <portRspPut> is bigger then rsp ring <portRspMax>

DESCRIPTION: The port rsp ring put index is larger than the size of the rsp ring.
DATA: None
ACTION: This error could indicate a software driver, firmware or hardware problem. Report these errors to Technical Support.

elx_mes0304: Stray mailbox interrupt, mbxCommand <mbxcommand> mbxStatus <mbxstatus>

DESCRIPTION: Received a mailbox completion interrupt and there are no outstanding mailbox commands.
DATA: None
ACTION: This error could indicate a hardware or firmware problem. If the problem persists, report the error to Technical Support.

elx_mes0306: CONFIG_LINK mbxStatus error <mbxStatus> HBA state <hba_state>

DESCRIPTION: The driver issued a CONFIG_LINK mbox command to the adapter that failed.
DATA: None
ACTION: This error could indicate a firmware or hardware problem. Report these errors to Technical Support.

elx_mes0310: Mailbox command <mbxcommand> timeout

DESCRIPTION: A mailbox command was posted to the adapter and did not complete within 30 seconds.
DATA: (1) hba_state, (2) sli_flag, (3) mbox_active
ACTION: This error could indicate a software driver or firmware problem. If no I/O is going through the adapter, reboot the system. If the problem persists, report the error to Technical Support.

elx_mes0311 Mailbox command x%x cannot issue Data: x%x x%x

DESCRIPTION: The driver detected an HBA error and can't issue the mailbox.
DATA: (1) sli flags (2) hba flags
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes0312: Ring <ringno> handler: portRspPut <rspPutInx> is bigger then rsp ring <numRiocb>

DESCRIPTION: The IOCB command rings put pointer is ahead of the get pointer.
DATA: None
ACTION: None required.

elx_mes0315: Ring <ringno> issue: portCmdGet <local_getidx> is bigger then cmd ring <max_cmd_idx>

DESCRIPTION: The port cmd ring get index is greater than the size of cmd ring.
DATA: None
ACTION: This error could indicate a software driver, firmware or hardware problem. Report these errors to Technical Support.

elx_mes0317: iotag <ulp_IoTag> is out of range: max iotag <max_iotag> wd0 <wd0>

DESCRIPTION: The IoTag in the completed IOCB is out of range.
DATA: None
ACTION: This error could indicate a software driver, firmware or hardware problem. Report these errors to Technical Support.

elx_mes0319: READ_SPARAM mbxStatus error <mbxStatus> hba state <hba_state>

DESCRIPTION: The driver issued a READ_SPARAM mbox command to the adapter that failed.
DATA: None
ACTION: This error could indicate a firmware or hardware problem. Report these errors to Technical Support.

elx_mes0320: CLEAR_LA mbxStatus error <mbxStatus> hba state <hba_state>

DESCRIPTION: The driver issued a CLEAR_LA mbox command to the adapter that failed.
DATA: None
ACTION: This error could indicate a firmware or hardware problem. Report these errors to Technical Support.

elx_mes0323: Unknown Mailbox command <mbxCommand> Cmpl

DESCRIPTION: A unknown mailbox command completed.
DATA: None
ACTION: This error could indicate a software driver, firmware or hardware problem. Report these errors to Technical Support.

elx_mes0324: Config port initialization error, mbxCmd <mbxCommand> READ_NVPARM, mbxStatus <mbxStatus>

DESCRIPTION: A read nvparams mailbox command failed during port configuration.
DATA: None
ACTION: This error could indicate a software driver, firmware or hardware problem. Report these errors to Technical Support.

elx_mes0330: IOCB wake NOT set

DESCRIPTION: The completion handler associated with the IOCB was never called.
DATA:(1) timeout, (2) timeleft/jiffies
ACTION: This error could indicate a software driver, firmware or hardware problem. If the problem persists, report the error to Technical Support.

elx_mes0332 IOCB wait issue failed, Data x%x

DESCRIPTION: Driver issued IO failed to complete in polling mode.
DATA: (1) error value.
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes0334: Unknown IOCB command

DESCRIPTION: Received an unknown IOCB command completion.
DATA: (1) type, (2) ulpCommand, (3) ulpStatus, (4) ulpIoTag, (5) ulpContext)
ACTION: This error could indicate a software driver or firmware problem. If these problems persist, report these errors to Technical Support.

elx_mes0335: Unknown IOCB command

DESCRIPTION: Received an unknown IOCB command completion.
DATA: (1) ulpCommand, (2) ulpStatus, (3) ulpIoTag, (4) ulpContext)
ACTION: This error could indicate a software driver or firmware problem. If these problems persist, report these errors to Technical Support

elx_mes0338 IOCB wait timeout error - no wake response Data x%x x%x

DESCRIPTION: Driver issued IO did not get a wake signal in polling mode.
DATA: (1) wait time (2) wake value
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes0340: Adapter temperature is OK now

DESCRIPTION: Adapter temperature has reverted to normal range.
DATA: Temperature in Celsius
ACTION: No action needed, informational.

elx_mes0341: Ring <ringno> Cannot find buffer for an unsolicited iocb tag <un.ulpWord[3]>

DESCRIPTION: There are no more pre-allocated buffers available to handle unsolicited buffers.
DATA: None
ACTION: Ensure this port is not being managed by multiple ports.

elx_mes0342: Ring <ringno> Cannot find buffer for an unsolicited iocb tag <unsli3.sli3Words>

DESCRIPTION: This is a multiple IOCB unsolicited command and sufficient buffer space cannot be allocated for it.
DATA: None
ACTION: None required.

elx_mes0343: Ring <ringno> Cannot find buffer for an unsolicited iocb tag <un.ulpWord[3]>

DESCRIPTION: There are no more pre-allocated buffers available to handle unsolicited buffers.
DATA: None
ACTION: None required.

elx_mes0344: Ring <ringno> Cannot find buffer for an unsolicited iocb tag <unsli3.sli3Words[7]>

DESCRIPTION: There are no more pre-allocated buffers available to handle unsolicited buffers.
DATA: None
ACTION: None required.

elx_mes0345: Resetting board due to mailbox timeout

DESCRIPTION: A mailbox command failed to complete. The driver is resetting the port.
DATA: None
ACTION: If the mailbox command fails again, set the lpfc_log_verbose to LOG_MBOX and retry.

elx_mes0346: Ring <ring number> handler: unexpected ASYNC_STATUS evt_code <evtcode> W0 <hex w0> W1 <hex w1> W2 <hex W2> W3 <hex W3> W4 <hex W4> W5 <hex Z5> W6 <hex W6> W7 <hex W7> W8 <hex W8> W9 <hex W9> W10 <hex W10> W11<hex W11>

DESCRIPTION: The adapter received an asynchronous event that was not a temperature event.
DATA: None
ACTION: None required.

elx_mes0347: Adapter is very hot, please take corrective action

DESCRIPTION: Adapter temperature is above normal range
DATA: Temperature in Celsius
ACTION: Shutdown and remove the adapter. Contact customer support.

elx_mes0348: NameServer login: node freed

DESCRIPTION: The enable mode failed to free up the nameserver login.
DATA: None
ACTION: None required.

elx_mes0349: rc should be MBX_SUCCESS

DESCRIPTION: The next mailbox command on the mailbox queue has failed.
DATA: None
ACTION: None required.

elx_mes0350: rc should have been MBX_BUSY

DESCRIPTION: Attempting to unregister a default RPI from an interrupt context and the mailbox state is not busy.
DATA: None
ACTION: None required.

elx_mes0352: Config MSI mailbox command failed, mbxCmd <u.mb.mbxCommand>, mbxStatus <u.mb.mbxStatus>

DESCRIPTION: The mailbox command sent to the firmware to configure the adapter to use MSI-X has failed.
DATA: None
ACTION: Ensure the hardware platform supports MSI-X.

elx_mes0359: Not a valid slow-path completion " event: majorcode=x%x, minorcode=x%x\n", bf_get(lpfc_eqe_major_code, eqe), bf_get(lpfc_eqe_minor_code, eqe));

DESCRIPTION: SLI-4: The EQE is not valid.
DATA: None
ACTION: None required.

elx_mes0360: Unsupported EQ count. <entry_count>

DESCRIPTION: Cannot create an event queue of this size.
DATA: None
ACTION: None required.

elx_mes0361: Unsupported CQ count. <entry_count>

DESCRIPTION: Cannot create a completion queue of this size.
DATA: None
ACTION: None required.

elx_mes0362: Unsupported MQ count. <entry_count>

DESCRIPTION: Cannot create MQ count of this size.
DATA: None
ACTION: None required.

elx_mes0364: Invalid param:

DESCRIPTION: SLI-4: The post SGL function was passed an invalid XRI.
DATA: None
ACTION: None required.

elx_mes0365: Slow-path CQ identifier <cqid> does not exist

DESCRIPTION: The Completion Queue ID passed in the Event Queue entry does not reference a valid completion queue.
DATA: None
ACTION: None required.

elx_mes0366: Not a valid fast-path completion event: majorcode=<major code hex>, minor-code=<minor code hex>

DESCRIPTION: The major or minor code in the Event Queue field is not valid.
DATA: None
ACTION: None required.

elx_mes0367: Fast-path completion queue does not exist

DESCRIPTION: The fast path completion queue referenced by the CQID does not exist.
DATA: None
ACTION: None required.

elx_mes0368: Miss-matched fast-path completion queue identifier: eqcqid=<cqid>, fcpcqid=<queue_id>

DESCRIPTION: The CQID in the event queue entry does not match the fcp_cqid that was passed into the routine.
DATA: None
ACTION: None required.

elx_mes0369: No entry from fast-path completion queue fcpcqid=<queue_id)

DESCRIPTION: There were no completions in the completion queue referenced by fcpcqid.
DATA: None
ACTION: None required.

elx_mes0370: Invalid completion queue type <type>

DESCRIPTION: The event queue entry is not for a mailbox or a work queue entry.
DATA: None
ACTION: None required.

elx_mes0371: No entry from the CQ: identifier <queue_id>, type <type>

DESCRIPTION: There was no completion queue event for this event queue entry.
DATA: None
ACTION: None required.

elx_mes0372: iotag <iotag> is out of range: max iotag (<sli.last_iotag>)

DESCRIPTION: The IOCB lookup cannot be performed because the iocb_tag is out of range.
DATA: None
ACTION: None required.

elx_mes0376: READ_REV Error. SLI Level <sli_rev> FCoE enabled <hba_flag & HBA_FCOE_SUPPORT>

DESCRIPTION: This SLI-4 only adapter setup function was called for a non-SLI-4 device.
DATA: None
ACTION: None required.

elx_mes0377: Error <rc> parsing vpd. Using defaults.

DESCRIPTION: Could not parse the VPD data, so the driver is using the default values.
DATA: None
ACTION: None required.

elx_mes0381: Error <rc> during queue setup.

DESCRIPTION: Could not set up all the queues that driver requires to exchange IOs with the adapter.
DATA: None
ACTION: Reload the driver.

elx_mes0382: READ_SPARAM command failed status <issue status>, mbxStatus <mailbox status>

DESCRIPTION: The READ_SPARAM mailbox command has failed during initialization. The adapter has been set to error state.
DATA: None
ACTION: Take a dump with hbacmd and then try reloading the driver.

elx_mes0384: There is pending active mailbox cmd

DESCRIPTION: The mailbox commands have overlapped. This command should have been added to the mailbox queue.
DATA: None
ACTION: None required.

elx_mes0385: rc should have been MBX_BUSY

DESCRIPTION: The completion handler for REG_LOGIN detected the IMMED_UNREG flag and tried to issue the unreg_login command from an interrupt level. The mailbox status should still be busy.
DATA: None
ACTION: None required.

elx_mes0387: Failed to allocate an iocbq

DESCRIPTION: Failed to get an IOCBQ from the list of available IOCBQs.
DATA: None

ACTION: None required.

elx_mes0388: Not a valid WCQE code: <hex cqe_code>

DESCRIPTION: The event code is invalid. This event is dropped.
DATA: None
ACTION: Ensure the adapter's firmware is current.

elx_mes0391: Error during rpi post operation

DESCRIPTION: The driver was trying to post pages to the firmware to be used to keep target login information and encountered a failure.
DATA: None
ACTION: Unload and reload the driver.

elx_mes0393: Error <rc> during rpi post operation

DESCRIPTION: The driver was trying to post pages to the firmware to keep target login information and encountered a failure.
DATA: None
ACTION: Unload and reload the driver.

elx_mes0394: Failed to allocate CQ_EVENT entry

DESCRIPTION: The asynchronous event handler was not able to allocate an event queue entry to which to transfer the asynchronous event.
DATA: None
ACTION: This could be a V-LINK clear from the switch or a fatal error from the firmware. Perform a dump from the OneCommand Manager application.

elx_mes0395: The mboxq allocation failed

DESCRIPTION: The asynchronous link event handler could not allocate a mailbox command to issue the READ_LA (read link attention) mailbox command.
DATA: None
ACTION: None required.

elx_mes0396: The lpfc_dmabuf allocation failed

DESCRIPTION: The asynchronous link event handler could not allocate a DMA buffer for the mailbox command to issue the READ_LA (read link attention) mailbox command.
DATA: None
ACTION: None required.

elx_mes0397: The mbuf allocation failed

DESCRIPTION: The asynchronous link event handler could not allocate DMA-able memory for the READ_LA mailbox command.
DATA: None
ACTION: None required.

elx_mes0398: Invalid link fault code: < hex link_fault>

DESCRIPTION: The attempt to read the link attention register has returned an unknown value.
DATA: None
ACTION: None required.

elx_mes0399: Invalid link attention type: <hex link_type>

DESCRIPTION: The READ_LA mailbox command has returned an invalid link type.
DATA: None
ACTION: None required.

Initialization Events (0400 - 0599)

elx_mes0400: Phys Attribute Count Exceeded, Max %d, Actual %d

DESCRIPTION: Too many driver configuration parameters have been set. The limit is given as Max.
DATA: (1) Maximum number (2) Actual number
ACTION: Reduce the number of actual parameters.

elx_mes0402: Cannot find virtual addr for buffer tag on ring <ringno>

DESCRIPTION: A DMA buffer is not available for this unsolicited command.
DATA: (1) tag, (2) next, (3) prev, (4) postbufq_cnt
ACTION: None required.

elx_mes0403: lpfc_nodev_tmo attribute cannot be set to <val>, allowed range is [<LPFC_MIN_DEVLOSS_TMO>, <LPFC_MAX_DEVLOSS_TMO>]

DESCRIPTION: Attempt to set the nodev timeout value is outside the range of the devloss timeout range.
DATA: None
ACTION: Set the nodev timeout between the minimum and maximum devloss timeout range.

elx_mes0404: Config Param %s set to x%x

DESCRIPTION: Driver is setting a persistent VPort parameter to a new value
DATA: (1) New value
ACTION: None. This message is notification only.

elx_mes0405: Config Param %s set to x%x

DESCRIPTION: Driver is setting a persistent VPort parameter to a new value.
DATA: (1) New value
ACTION: None. This message is notification only.

elx_mes0406: Adapter maximum temperature exceeded (<temperature>), taking this port offline

DESCRIPTION: The driver has received an error for the adapter indicating that the maximum allowable temperature has been exceeded.
DATA: (1) work_hs, (2) work_status[0], (3) work_status[1]
ACTION: Ensure the server fans are not blocked. Shut down the server if the airflow is restricted.

elx_mes0410: Cannot find virtual addr for mapped buf on ring <ringno>

DESCRIPTION: The driver cannot find the specified buffer in its mapping table. Thus it cannot find the virtual address needed to access the data.
DATA: (1) phys, (2) next, (3) prev, (4) postbufq_cnt
ACTION: This error could indicate a software driver or firmware problem. If the problem persists report these errors to Technical Support.

elx_mes0423: Vport Attribute Instance Error. Defaulting lpfc_#attr to %d, error value %d, allowed range is [min, max]

DESCRIPTION: A Vport attribute was set out of range. The driver reset the parameter to its default.
DATA: None
ACTION: Set the module parameter between the minimum and maximum values.

elx_mes0424: Vport Attribute Count Exceeded, Max %d, Actual %d

DESCRIPTION: The total number of Vport attributes set exceeded the max allowed.
DATA: None
ACTION: Reduce the number set attributes below max.

elx_mes0425: lpfc_"#attr" attribute cannot be set to %d, allowed range is [min, max]

DESCRIPTION: Driver attribute lpfc_#attr was defined with an out-of-range value.
DATA: None
ACTION: Set the parameter between the minimum and maximum value.

elx_mes0427: Cannot re-enable interrupt after slot reset.

DESCRIPTION: The driver was not able to enable the interrupt after an adapter reset.
DATA: None
ACTION: Unload and reload the driver.

elx_mes0430: PM resume Failed to enable interrupt

DESCRIPTION: The driver’s power management resume function could not enable the interrupt.
DATA: None
ACTION: Perform another PM suspend and resume or adapter reset.

elx_mes0431: Failed to enable interrupt.

DESCRIPTION: The driver failed to start the interrupt.
DATA: None
ACTION: Unload and reload the driver.

elx_mes0433: Wakeup on signal: rc=<rc>

DESCRIPTION: A signal other than the LPFC_DATA_READY was received on the worker thread. DATA: None
ACTION: Unload and reload the driver.

elx_mes0434: PM resume failed to start worker thread: error=<error>.

DESCRIPTION: The driver's power management resume function could not start the worker thread.
DATA: None
ACTION: Unload and reload the driver.

elx_mes0435: Adapter failed to get Option ROM version status <rc>.

DESCRIPTION: The driver could not read the adapter’s option ROM.
DATA: None
ACTION: Reset the adapter. Ensure the adapter’s firmware is current.

elx_mes0436: Adapter failed to init, timeout, status reg <status>

DESCRIPTION: The adapter failed during powerup diagnostics after it was reset.

DATA: None
ACTION: This error could indicate a hardware or firmware problem. If the problem persists, report the error to Technical Support.

elx_mes0437: Adapter failed to init, chipset, status reg <status>

DESCRIPTION: The adapter failed during powerup diagnostics after it was reset.
DATA: None
ACTION: This error could indicate a hardware or firmware problem. If the problem persists, report the error to Technical Support.

elx_mes0438: Adapter failed to init, chipset, status reg <status>

DESCRIPTION: The adapter failed during powerup diagnostics after it was reset.
DATA: None
ACTION: This error could indicate a hardware or firmware problem. If the problem persists, report the error to Technical Support.

elx_mes0439: Adapter failed to init, mbxCmd <mbxCommand> READ_REV, mbxStatus <mbxStatus>

DESCRIPTION: Adapter initialization failed when issuing a READ_REV mailbox command.
DATA: None
ACTION: This error could indicate a hardware or firmware problem. If the problem persists, report the error to Technical Support.

elx_mes0440: Adapter failed to init, READ_REV has missing revision information

DESCRIPTION: A firmware revision initialization error was detected.
DATA: None
ACTION: This error could indicate a hardware or firmware problem. Update the firmware. If the problem persists, report the error to Technical Support.

elx_mes0442: Adapter failed to init, mbxCmd <mbxCommand> CONFIG_PORT, mbxStatus <mbxStatus>

DESCRIPTION: Adapter initialization failed when issuing a CONFIG_PORT mailbox command.
DATA: (1) hbainit
ACTION: This error could indicate a hardware or firmware problem. If the problem persists, report the error to Technical Support.

elx_mes0443: Adapter failed to set maximum DMA length mbxStatus <u.mb.mbxStatus>.

DESCRIPTION: Cannot set the maximum DMA length to reflect cfg_pci_max_read.
DATA: None
ACTION: Set module parameter lpfc_pci_max_read to 512, 1024, 2048, or 4096.

elx_mes0445: Firmware initialization failed.

DESCRIPTION: The driver was unable to initialize the hardware.
DATA: None
ACTION: This error could indicate a hardware or firmware problem. If the problem persists, report the error to Technical Support.

elx_mes0446: Adapter failed to init, mbxCmd <mbxCommand> CFG_RING, mbxStatus <mbxStatus>, ring <num>

DESCRIPTION: Adapter initialization failed when issuing a CFG_RING mailbox command.
DATA: None
ACTION: This error could indicate a hardware or firmware problem. If the problem persists, report the error to Technical Support.

elx_mes0448: Adapter failed to init, mbxCmd <mbxCommand> READ_SPARM, mbxStatus <mbxStatus>

DESCRIPTION: Adapter initialization failed when issuing a READ_SPARM mailbox command.
DATA: None
ACTION: This error could indicate a hardware or firmware problem. If the problem persists, report the error to Technical Support.

elx_mes0449: Phys attribute Instance Error. Defaulting to lpfc_#attr to %d. Allowed range is [min, max]

DESCRIPTION: A physical device attribute has an out-of-range value. The driver is correcting it.
DATA: (1) value written, (2) minimum value, (3) maximum value
ACTION: Write the default value.

elx_mes0450: lpfc_%attr attribute cannot be set to%d, allowed range is [%min, %max]

DESCRIPTION: Sysfs attribute value written exceeds attribute range
DATA: (1) attribute name, (2) value written, (3) minimum value, (3) maximum value
ACTION: Write a value within the supported range.

elx_mes0453: Adapter failed to init, mbxCmd <mbxCommand> READ_CONFIG, mbxStatus<mbxStatus>

DESCRIPTION: Adapter initialization failed when issuing a READ_CONFIG mailbox command.
DATA: None
ACTION: This error could indicate a hardware or firmware problem. If the problem persists, report the error to Technical Support.

elx_mes0454: Adapter failed to init, mbxCmd <mbxCommand> INIT_LINK, mbxStatus <mbxStatus>

DESCRIPTION: Adapter initialization failed when issuing an INIT_LINK mailbox command.
DATA: None
ACTION: This error could indicate a hardware or firmware problem. If the problem persists, report the error to Technical Support.

elx_mes0456: Adapter failed to issue ASYNCEVT_ENABLE mbox status <rc>.

DESCRIPTION: The mailbox command to enable an asynchronous event notification failed.
DATA: None
ACTION: Ensure the adapter firmware is current. Reload the driver.

elx_mes0457: Adapter Hardware Error

DESCRIPTION: The driver received an interrupt indicating a possible hardware problem.
Data: (1) status, (2) status1, (3) status2
ACTION: This error could indicate a hardware or firmware problem. If the problem persists, report the error

to Technical Support.

elx_mes0472: Unknown PCI error state: x%x

DESCRIPTION: The PCI bus has detected an error.
DATA: (1) state value
ACTION: Driver resets the adapter and attempts recovery. If problem persists, contact Emulex technical support.

elx_mes0474: Unable to allocate memory for issuing "MBOX_CONFIG_MSI command”

DESCRIPTION: Mailbox memory pool allocation error.
DATA: None
ACTION: None required.

elx_mes0475: Not configured for supporting MSI-X cfg_use_msi: <cfg_use_msi>.

DESCRIPTION: The lpfc_use_msi module parameter should have been set to 2.
DATA: None
ACTION: Set module parameter lpfc_use_msi=2.

elx_mes0476: HBA not supporting SLI-3 or later SLI Revision: <sli_rev>.

DESCRIPTION: The adapter does not support SLI-3 or SLI-4.
DATA: None
ACTION: This adapter does not support msi. Set lpfc_use_msi=0.

elx_mes0479: Deferred Adapter Hardware Error

DESCRIPTION: An adapter hardware error was sent to the driver.
DATA: (1) work_hs, (2) work_status[0], (3) work_status[1]
ACTION: Perform a dump using hbacmd.

elx_mes0482 Illegal interrupt mode

DESCRIPTION: Driver could not set MSI-X, MSI or INTX interrupt modes.
DATA:
ACTION: This could be a server issue. Reboot. If this problem persists, report these errors to Technical Support

elx_mes0483: Invalid link-attention link speed: x%x", bf_get(lpfc_acqe_link_speed, acqe_link).

DESCRIPTION: The link speed reported in the link attention interrupt is invalid.
DATA: None
ACTION: Check the switch configuration.

elx_mes0492 Unable to allocate memory for issuing SLI_CONFIG_SPECIAL mailbox command

DESCRIPTION: A memory allocation fault occurred when issuing a mailbox.
DATA:
ACTION: This could be a transient error. If this problem persists, report these errors to Technical Support

elx_mes0493: SLI_CONFIG_SPECIAL mailbox failed with status <rc>.

DESCRIPTION: Mailbox command failed.
DATA: None

ACTION: Ensure the adapter's firmware is current. Unload and reload the driver.

elx_mes0494: Unable to allocate memory for issuing "SLI_FUNCTION_RESET mailbox command"

DESCRIPTION: Mailbox memory pool allocation error.
DATA: None
ACTION: The driver fails to load. Contact Emulex Technical Support.

elx_mes0495: SLI_FUNCTION_RESET mailbox failed with status <shdr_status> add_status <shdr_add_status>, mbx status <rc>.

DESCRIPTION: Mailbox command failed.
DATA: None
ACTION: The driver fails to load. Contact Emulex Technical Support.

elx_mes0496: Failed allocate slow-path EQ

DESCRIPTION: The event queue for the slow path was not allocated.
DATA: None
ACTION: Unload and reload the driver.

elx_mes0497: Failed allocate fast-path EQ

DESCRIPTION: The event queue for the fast path was not allocated.
DATA: None
ACTION: Unload and reload the driver.

elx_mes0499: Failed allocate fast-path FCP CQ (<fcp_cqidx>).

DESCRIPTION: The completion queue event for the fast path could not be allocated.
DATA: None
ACTION: The driver fails to load. Contact Emulex Technical Support.

elx_mes0500: Failed allocate slow-path mailbox CQ

DESCRIPTION: Failed to allocate slow-path mailbox CQ.
DATA: None
ACTION: The driver fails to load. Contact Emulex Technical Support.

elx_mes0501: Failed allocate slow-path ELS CQ

DESCRIPTION: Failed to allocate slow-path ELS CQ.
DATA: None
ACTION: The driver fails to load. Contact Emulex Technical Support.

elx_mes0503: Failed allocate fast-path FCP

DESCRIPTION: Failed to allocate fast-path FCP.
DATA: None
ACTION: The driver fails to load. Contact Emulex Technical Support.

elx_mes0504: Failed allocate slow-path ELS WQ

DESCRIPTION: Failed to allocate slow-path ELS WQ.
DATA: None
ACTION: The driver fails to load. Contact Emulex Technical Support.

elx_mes0505: Failed allocate slow-path MQ

DESCRIPTION: Failed to allocate slow-path MQ.
DATA: None
ACTION: The driver fails to load. Contact Emulex Technical Support.

elx_mes0506: Failed allocate receive HRQ

DESCRIPTION: Failed to allocate receive HRQ.
DATA: None
ACTION: The driver fails to load. Contact Emulex Technical Support.

elx_mes0507: Failed allocate receive DRQ

DESCRIPTION: Failed to allocate receive DRQ.
DATA: None
ACTION: The driver fails to load. Contact Emulex Technical Support.

elx_mes0520: Slow-path EQ not allocated

DESCRIPTION: The slow-path EQ is not allocated.
DATA: None
ACTION: The driver fails to load. Contact Emulex Technical Support.

elx_mes0521: Failed setup of slow-path EQ rc = 0x%x

DESCRIPTION: The slow-path EQ setup failed with status rc.
DATA: (1) status code
ACTION: The driver fails to load. Contact Emulex Technical Support.

elx_mes0522: Fast-path EQ <fcp_eqidx> not allocated

DESCRIPTION: The fast-path EQ is not allocated.
DATA: None
ACTION: The driver fails to load. Contact Emulex Technical Support.

elx_mes0523: Failed setup of fast-path EQ <fcp_eqidx>, rc = <rc>

DESCRIPTION: The fast-path EQ setup failed.
DATA: None
ACTION: The driver fails to load. Contact Emulex Technical Support.

elx_mes0526: Fast-path FCP CQ <fcp_cqidx> not allocated

DESCRIPTION: The fast-path FCP is not allocated.
DATA: None
ACTION: The driver fails to load. Contact Emulex Technical Support.

elx_mes0527: Failed setup of fast-path FCP CQ <fcp_cqidx>, rc = <rc>

DESCRIPTION: The fast-path FCP CQ setup failed.
DATA: None
ACTION: The driver fails to load. Contact Emulex Technical Support.

elx_mes0528: Mailbox CQ not allocated

DESCRIPTION: The mailbox CQ is not allocated.
DATA: None

ACTION: The driver fails to load. Contact Emulex Technical Support.

elx_mes0529 Failed setup of slow-path mailbox CQ: rc = 0x%x

DESCRIPTION: Driver failed to setup Completion Queue. Failure code is reported
DATA:
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes0530: ELS CQ not allocated

DESCRIPTION: The ELS CQ is not allocated.
DATA: None
ACTION: The driver fails to load. Contact Emulex Technical Support.

elx_mes0531: 0531 Failed setup of slow-path ELS CQ: rc = 0x%x

DESCRIPTION: The ELS CQ is allocated, but failed initial setup.
DATA: (1) status
ACTION: The driver fails to load. Contact Emulex Technical Support.

elx_mes0534: Fast-path FCP WQ <fcp_eqidx> not allocated

DESCRIPTION: The fast-path FCP WQ is not allocated.
DATA: None
ACTION: The driver fails to load. Contact Emulex Technical Support.

elx_mes0535: Failed setup of fast-path FCP WQ <fcp_wqidx>, rc = <rc>

DESCRIPTION: The fast-path FCP WQ setup failed.
DATA: None
ACTION: The driver fails to load. Contact Emulex Technical Support.

elx_mes0536: Slow-path ELS WQ not allocated

DESCRIPTION: The slow-path ELS WQ is not allocated.
DATA: None
ACTION: The driver fails to load. Contact Emulex Technical Support.

elx_mes0537 Failed setup of slow-path ELS WQ: rc = 0x%x

DESCRIPTION: Driver failed to setup Work Queue. Failure code is reported.
DATA: (1) (2) (3)
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes0538: Slow-path MQ not allocated

DESCRIPTION: The slow-path MQ is not allocated.
DATA: None
ACTION: The driver fails to load. Contact Emulex Technical Support.

elx_mes0539: Failed setup of slow-path MQ: rc = 0x%x

DESCRIPTION: The slow-path MQ is allocated, but failed initial setup
DATA: (1) status
ACTION: The driver fails to load. Contact Emulex Technical Support.

elx_mes0540: Receive Queue not allocated

DESCRIPTION: The Receive Queue is not allocated.
DATA: None
ACTION: The driver fails to load. Contact Emulex Technical Support.

elx_mes0541: Failed setup of Receive Queue: rc = 0x%x

DESCRIPTION: The Receive Queue is allocated, but failed setup.
DATA: (1) status
ACTION: The driver fails to load. Contact Emulex Technical Support.

elx_mes0542: lpfc_create_static_vport failed to allocate mailbox memory

DESCRIPTION: Failed to allocate mailbox memory for VPort creation.
DATA: None
ACTION: Static VPorts does not load. Contact Emulex Technical Support.

elx_mes0543: lpfc_create_static_vport failed to allocate vport_info

DESCRIPTION: Failed to allocate VPort_info.
DATA: None
ACTION: Static VPorts does not load. Contact Emulex Technical Support

elx_mes0545: lpfc_create_static_vport bad information header 0x%x 0x%x, le32_to_cpu(vport_info->signature), le32_to_cpu(vport_info->rev) & VPORT_INFO_REV_MASK);

DESCRIPTION: Invalid information header; the signature or revision is invalid.
DATA: None
ACTION: Static VPorts does not load. Contact Emulex Technical Support.

elx_mes0582: Error <rc> during sgl post operation

DESCRIPTION: The SGL post operation failed.
DATA: None
ACTION: None required.

elx_mes0602: Failed to allocate CQ_EVENT entry

DESCRIPTION: Failed to allocate a CQ_EVENT entry.
DATA: None
ACTION: None required.

elx_mes0603: Invalid work queue CQE subtype <subtype>

DESCRIPTION: Invalid work queue CQE.
DATA: None
ACTION: None required.

FCP Traffic History (0700 - 0799)

elx_mes0700: Bus Reset on target <i> failed

DESCRIPTION: The bus reset for the specified target failed.
DATA: None
ACTION: None required.

elx_mes0706: 0706 IOCB Abort failed - outstanding %d failed %d

DESCRIPTION: The driver did not recover all IO following a reset task management command
DATA: (1) outstanding IO count (2) number of unrecovered IO
ACTION: Reset call fails to. ESX tries to recover.

elx_mes0713: SCSI layer issued Device Reset (%d, %d) reset status x%x flush status x%x

DESCRIPTION: A device reset has completed on (tgt, lun). Status values are displayed.
DATA: (1) tgt (2) lun (3) task mgmt status (4) flush status
ACTION: None required.

elx_mes0714: SCSI layer issued bus reset

DESCRIPTION: The SCSI layer is requesting the driver to abort all I/Os to all targets on this adapter.
DATA: (1) ret
ACTION: Check the state of the targets in question.

elx_mes0718: Unable to dma_map single request_buffer: x%x

DESCRIPTION: The driver could not map a single virtual address to a dma address.
DATA: (1) dma mapping error
ACTION: None. The driver fails the IO back to ESX.

elx_mes0721: Device Reset rport failure: rdata <rdata>

DESCRIPTION: The reset of the Rport failed.
DATA: None
ACTION: None required.

elx_mes0724: I/O flush failure for context <cntx> on <tgt:lun> cnt x%x

DESCRIPTION: The I/O flush to the {LUN, TARGET or HOST} has failed.
DATA: (1) cnt of unrecovered IO
ACTION: None required. The reset is retried.

elx_mes0727: TMF <cmd> to TGT <TGT#> LUN <LUN#> failed (<ulpStatus>, <ulpWord[4]>)

DESCRIPTION: The task management command failed.
DATA: None
ACTION: None required. The TMF command gets retried.

elx_mes0748: Abort handler timed out waiting for abort to complete:ret <status> ID <target id>

LUN <lun id> snum <serial number>
DESCRIPTION: The abort handler timed out waiting for abort to complete.
DATA: None
ACTION: None required.

elx_mes0798 Device Reset rport failure: rdata x%p

DESCRIPTION: Driver failed a device reset - no rdata buffer
DATA:
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

Node Table Events (0900 - 0999)

elx_mes0915: Register VPI failed: <mbxStatus>

DESCRIPTION: Could not register the VPI.
DATA: None
ACTION: None required.

Miscellaneous and FCoE Events (1200 - 1299)

elx_mes1201 Failed to allocate dfc_host

DESCRIPTION: Driver failed to allocate a dfc host and bind it to the management stack.
DATA:
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes1209 C_CT Request error Data: x%x x%x

DESCRIPTION: IOCTL CT response error - driver is failing the IOCTL request.
DATA: (1) response buffer flag (2) Data Size
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes1262: Failed to allocate dfc_host

DESCRIPTION: Could not allocate memory the dfc_host_struct.
DATA: None
ACTION: None required.

Link Events (1300 - 1399)

elx_mes1300 Link Down Event in loop back mode

DESCRIPTION: Driver received a link down event while in loopback mode - unexpected event.
DATA:
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes1302 Invalid speed for this board: Reset link speed to auto: x%x

DESCRIPTION: Driver detected an invalid link speed. Resetting Link to Auto mode.
DATA: (1) Invalid speed detected
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes1303: Link Up Event <eventTag> received Data: x%x x%x x%x x%x x%x x%x %d

DESCRIPTION: A link up event was received. It is also possible for multiple link events to be received together.
DATA:(1) fc_eventTag, (2) granted_AL_PA, (3) UlnkSpeed, (4) alpa_map[0]
ACTION: If numerous link events are occurring, check the physical connections to the Fibre Channel network.

elx_mes1305: Link Down Event <eventTag> received Data: x%x x%x x%x

DESCRIPTION: A link down event was received.
DATA: (1) fc_eventTag, (2) hba_state, (3) fc_flag

ACTION: If numerous link events are occurring, check the physical connections to the Fibre Channel network.

elx_mes1306: Link Up Event in loop back mode<eventTag> received Data: x%x x%x x%x x%x

DESCRIPTION: Link up notification; configured for loopback.
DATA: (1) fc_eventTag, (2) granted_AL_PA, (3) UlnkSpeed, (4) alpa_map[0]
ACTION: None required.

elx_mes1308: Menlo Maint Mode Link up Event x%x rcvd Data: x%x x%x x%x

DESCRIPTION: Link up notification in Menlo maintenance mode.
DATA: (1) fc_eventTag, (2) port_state, (3) VPort fc_flag
ACTION: None required.

elx_mes1309: Link Down Event x%x received Data x%x x%x x%x

DESCRIPTION: The port generated a link down event to the host.
DATA: (1) fc_eventTag (2)port_state (3) VPort fc_flag
ACTION: None required.

elx_mes1310: Link Up Event npiv not supported in loop topology

DESCRIPTION: Loop topologies are not supported when NPIV is enabled.
DATA: None
ACTION: Put link into Fabric mode.

Reserved (1400 - 1499)

elx_mes1400: Failed to initialize sgl list.

DESCRIPTION: Failed to initialize SGL list during initialization.
DATA: None
ACTION: Reboot the server. If the issue persist, contact technical support.

elx_mes1401: Failed to enable pci device.

DESCRIPTION: Failed to enable PCI device during initialization.
DATA: None
ACTION: Reboot the server. If the issue persist, contact technical support.

elx_mes1402: Failed to set up pci memory space.

DESCRIPTION: PCI initialization failed.
DATA: None
ACTION: Reboot the server. If the issue persist, contact technical support.

elx_mes1403: Failed to set up driver resource.

DESCRIPTION: Driver resource initialization failed.
DATA: None
ACTION: None required.

elx_mes1404: Failed to set up driver resource.

DESCRIPTION: Driver resource initialization failed.

DATA: None
ACTION: None required.

elx_mes1405: Failed to initialize iocb list.

DESCRIPTION: IOCB initialization failed.
DATA: None
ACTION: None required.

elx_mes1406: Failed to set up driver resource.

DESCRIPTION: Initialization failed to set up driver resource.
DATA: None
ACTION: None required.

elx_mes1407: Failed to create scsi host.

DESCRIPTION: Initialization failed to create SCSI host.
DATA: None
ACTION: None required.

elx_mes1408: Failure HBA POST Status: sta_reg=<status reg>, perr=<port error>, sfi=<sfi reg>, nip=<nip reg>, ipc=<ipc reg>, xrom=<xrom>, dl=<dl reg>, pstatus=<port status>

DESCRIPTION: The adapter's power on self test has failed.
DATA: None
ACTION: Make sure the adapter firmware is up to date. Contact the technical support if the issue persists after system reboot.

elx_mes1409: Failed to enable pci device.

DESCRIPTION: Failed to enable PCI device during initialization.
DATA: None
ACTION: None required.

elx_mes1410: Failed to set up pci memory space.

DESCRIPTION: Initialization failed to set up PCI memory space.
DATA: None
ACTION: None required.

elx_mes1411: Failed to set up driver resource.

DESCRIPTION: Initialization failed to set up driver resource.
DATA: None
ACTION: None required.

elx_mes1412: Failed to set up driver resource.

DESCRIPTION: Initialization failed to set up driver resource.
DATA: None
ACTION: None required.

elx_mes1413: Failed to initialize iocb list.

DESCRIPTION: Initialization failed to initialize the IOCB list.
DATA: None

ACTION: None required.

elx_mes1414: Failed to set up driver resource.

DESCRIPTION: Initialization failed to set up driver resource.
DATA: None
ACTION: None required.

elx_mes1415: Failed to create scsi host.

DESCRIPTION: Initialization failed to create SCSI host.
DATA: None
ACTION: None required.

elx_mes1416: Failed to allocate sysfs attr

DESCRIPTION: Initialization failed to sysfs attribute.
DATA: None
ACTION: None required.

elx_mes1418: Invalid HBA PCI-device group: <dev_grp>

DESCRIPTION: Invalid adapter PCI-device group detected.
DATA: None
ACTION: None required.

elx_mes1419: Invalid HBA PCI-device group: <dev_grp>

DESCRIPTION: Invalid adapter PCI-device group detected.
DATA: None
ACTION: None required.

elx_mes1420: Invalid HBA PCI-device group: <dev_grp>

DESCRIPTION: Invalid adapter PCI-device group detected.
DATA: None
ACTION: None required.

elx_mes1421: Failed to set up hba

DESCRIPTION: Initialization failed to set up the adapter.
DATA: None
ACTION: None required.

elx_mes1422: HBA Unrecoverable error: uerr_lo_reg=<ue lo>, uerr_hi_reg=<ue hi>, online0_reg=<Online0>, online1_reg=<Online1>

DESCRIPTION: The adapter has notified the driver that it has encountered an unrecoverable error.
DATA: None
ACTION: A dump from the OneCommand Manager application should be taken. Then, the driver should be unloaded and reloaded.

elx_mes1423: HBA Unrecoverable error: uerr_lo_reg=<ue lo>, uerr_hi_reg=<ue hi>, online0_reg=<Online0>, online1_reg=<Online1>.

DESCRIPTION: The adapter has notified the driver that it has encountered an unrecoverable error.
DATA: None

ACTION: A dump from the OneCommand Manager application should be taken. Then, unload and reload the driver.

elx_mes1424: Invalid PCI device group: <pci_dev_grp>

DESCRIPTION: Invalid adapter PCI-device group detected.
DATA: None
ACTION: None required.

elx_mes1425: Invalid PCI device group: <pci_dev_grp>

DESCRIPTION: Invalid adapter PCI-device group detected.
DATA: None
ACTION: None required.

elx_mes1426: Invalid PCI device group: <pci_dev_grp>

DESCRIPTION: Invalid adapter PCI-device group detected.
DATA: None
ACTION: None required.

elx_mes1427: Invalid PCI device group: <pci_dev_grp>

DESCRIPTION: Invalid adapter PCI-device group detected.
DATA: None
ACTION: None required.

elx_mes1428: Invalid PCI device group: <pci_dev_grp>

DESCRIPTION: Invalid adapter PCI-device group detected.
DATA: None
ACTION: None required.

elx_mes1429: Invalid PCI device group: <pci_dev_grp>

DESCRIPTION: Invalid adapter PCI-device group detected.
DATA: None
ACTION: None required.

elx_mes1430: Failed to initialize sgl list.

DESCRIPTION: Failed to initialize SGL list.
DATA: None
ACTION: None required.

elx_mes1431: Invalid HBA PCI-device group: <dev_grp>

DESCRIPTION: Invalid adapter PCI-device group detected.
DATA: None
ACTION: None required.

elx_mes1432: Failed to initialize rpi headers.

DESCRIPTION: RPI headers required by the firmware failed to initialize.
DATA: None
ACTION: None required.

elx_mes1476: Failed to allocate sysfs attr.

DESCRIPTION: Failed to allocate sysfs attribute.
DATA: None
ACTION: None required.

elx_mes1477: Failed to set up hba

DESCRIPTION: Failed to set up adapter.
DATA: None
ACTION: None required.

IOCTL Events (1600 - 1699)

None.

VPort Events (1800 - 1832)

elx_mes1800 Could not issue unreg_vpi

DESCRIPTION: Driver attempt to unregister VPI failed
DATA: None
ACTION: Software driver error. If this problem persists, report these errors to Technical Support.

elx_mes1801 Create vport work array FAILED: cannot do scsi_host_get

DESCRIPTION: Driver failed to create working list of vports.
DATA:
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes1802 HBQ <index>: local_hbqGetIdx <index> is > than hbqp->entry_count <count>

DESCRIPTION: An error occurred when processing queue related to an adapter in a particular slot.
DATA: (1) hbqno, (2) local_hbqGetIdx, (3) entry_count
ACTION: Software driver error. If this problem persists, report these errors to Technical Support.

elx_mes1803 Bad hbq tag. Data: <tag> <count>

DESCRIPTION: An error occurred when processing queue related tags for an adapter in a particular slot.
DATA: (1) tag, (2) buffer_count
ACTION: Software driver error. If this problem persists, report these errors to Technical Support.

elx_mes1804: Invalid asynchronous event code: <evt code>

DESCRIPTION: The asynchronous event code that the firmware passed to the driver is invalid.
DATA: None
ACTION: None required.

elx_mes1805 Adapter failed to init.Data: <command> <status> <queue num>

DESCRIPTION: An error occurred when processing queue related tags for an adapter in a particular slot.
DATA: (1) mbxCommand, (2) mbxStatus, (3) hbaqno
ACTION: Software driver error. If this problem persists, report these errors to Technical Support.

elx_mes1806 Mbox <command> failed. No vport.

DESCRIPTION: A mailbox command could not be communicated because there was no VPort associated with the mailbox command.
DATA: (1) mbxCommand
ACTION: Software driver error. If this problem persists, report these errors to Technical Support.

elx_mes1807 IOCB <value> failed. No vport

DESCRIPTION: An IOCB command could not be communicated because there was no VPort associated with the mailbox command.
DATA: (1) ulpCommand
ACTION: Software driver error. If this problem persists, report these errors to Technical Support.

elx_mes1808 Create VPORT failed: NPIV is not enabled: SLImode <mode>

DESCRIPTION: The driver failed to create a port because the adapter was in wrong mode or was not capable of NPIV.
DATA: (1) sli_rev
ACTION: Load the driver with npiv enabled on an adapter that supports SLI-3.

elx_mes1809 Create VPORT failed: Max VPORTs (<vpi>) exceeded.

DESCRIPTION: The driver failed to create a port because the maximum number of port supported by the driver is exceeded.
DATA: (1) max_vpi
ACTION: No Action. The driver can not create any more VPorts.

elx_mes1810 Create VPORT failed: Cannot get instance number.

DESCRIPTION: The driver failed to allocate resources for an adapter and could not assign an instance number
DATA: None
ACTION: Software driver error. If this problem persists, report these errors to Technical Support.

elx_mes1811 Create VPORT failed: vpi x<vpi>

DESCRIPTION: The driver failed to create a port and had to eliminate all its resources.
DATA: (1) vpi
ACTION: Software driver error. If this problem persists, report these errors to Technical Support.

elx_mes1812 vport_delete failed: Cannot delete physical host

DESCRIPTION: An attempt to delete a port failed because it was to delete a physical port and not a virtual port. Only VPorts on physical ports can be deleted on an NPIV system.
DATA: None
ACTION: Software driver error. If this problem persists, report these errors to Technical Support.

elx_mes1813 Create VPORT failed. Cannot get sparam.

DESCRIPTION: The port could not be created because it could not be initialized possibly due to unavailable resources.
DATA: None
ACTION: Software driver error. If this problem persists, report these errors to Technical Support.

elx_mes1814: Mbox <u.mb.mbxCommand> failed, no vport

DESCRIPTION: The VPort field of this mailbox command was not completed.
DATA: None
ACTION: None required.

elx_mes1815 Could not issue unreg_did (default rpis)

DESCRIPTION: Attempt to unregister RPI failed.
DATA: None
ACTION: Software driver error. If this problem persists, report these errors to Technical Support.

elx_mes1818 VPort failed init, mbxCmd <mailbox command> READ_SPARM mbxStatus

<mailbox status>, rc = <status>
DESCRIPTION: A pending mailbox command issued to initialize port failed.
DATA: (1) mbxCommand, (2) mbxStatus, (3) rc
ACTION: Software driver error. If this problem persists, report these errors to Technical Support.

elx_mes1820 Unable to select SLI-3. Not supported by adapter.

DESCRIPTION: The adapter is not capable of operating in a given mode.
DATA: None
ACTION: This is an informational message. SLI-3 mode is only available on some adapters. Do not attempt to force an adapter to run in SLI mode 3 if that adapter does not support SLI-3 mode. Adapters that do not support SLI-3 are configured to run in SLI-2 mode. Nevertheless, it is recommended to use the auto setting (0).

elx_mes1821 Create VPORT failed. Invalid WWN format

DESCRIPTION: The port could not be created due to an invalid WWNN or WWPN format.
DATA: None
ACTION: Provide a valid WWN when creating VPorts.

elx_mes1822 Invalid <name>: <xx: xx: xx: xx: xx: xx: xx: xx>

DESCRIPTION: An invalid WWN was used when creating a VPort.
DATA: (1) type_name, (2) wwn[1], (3) wwn[3], (3) wwn[5], (4) wwn[7]
ACTION: When creating a VPort you must furnish a valid WWN.

elx_mes1823 Create VPORT failed. Duplicate WWN on HBA.

DESCRIPTION: The port could not be created because it would duplicate an existing WWNN adapter address. The resources for the port had to be discarded.
DATA: None
ACTION: Provide a WWN that is unique.

elx_mes1825 Vport Created.

DESCRIPTION: This message is displayed to indicate that a port was created in the system. It is displayed at this level to ensure it is always appears at all log levels.
DATA: None
ACTION: No action, informational.

elx_mes1826 Vport Disabled.

DESCRIPTION: The port had to be disabled in the system.

DATA: None
ACTION: No action, informational.

elx_mes1827 Vport Enabled.

DESCRIPTION: The port had to be enabled after possible recovery from some errors.
DATA: None
ACTION: No action, informational.

elx_mes1828 Vport Deleted.

DESCRIPTION: A VPort was deleted.
DATA: None
ACTION: No action, informational.

elx_mes1830 Signal aborted mbxCmd <command>

DESCRIPTION: A pending mailbox command was aborted because the thread received a signal.
DATA: None
ACTION: The command is retried.

elx_mes1831 Create VPORT Interrupted.

DESCRIPTION: The port creation process was unexpectedly interrupted at a critical time and the operation was unsuccessful.
DATA: None
ACTION: The process was interrupted while creating a VPort. Retry the command.

elx_mes1832: No pending MBOX command to handle.

DESCRIPTION:
DATA: None
ACTION:

ELS Events (1833 - 2800)

elx_mes1835: Vport discovery quiesce failed: state <port_state> fc_flags <fc_flag> wait msecs <jiffies_to_msecs(jiffies - start_time)>

DESCRIPTION: Could not pause discovery on this VPort.
DATA: None
ACTION: None required.

elx_mes1836: Could not issue unreg_login(all_rpis) status <rc>

DESCRIPTION: The unreg_login cannot be issued.
DATA: None
ACTION: None required.

elx_mes1837: vport_delete failed: Cannot delete static vport.

DESCRIPTION: Static VPorts cannot be deleted.
DATA: None
ACTION: None required.

elx_mes1838: Failed to INIT_VPI on vpi <vpi> status <rc>

DESCRIPTION: Failed to INIT_VPI.
DATA: None
ACTION: None required.

elx_mes1839 Create VPORT failed. vname allocation failed.

DESCRIPTION: Driver failed to allocate buffer for Virtual Machine name.
DATA:
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes1920 Exec format error, Dropping Link state event

DESCRIPTION: No dfchba instance available for Link State event - dropping.
DATA:
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes1923 Exec format error, Dropping rscn event

DESCRIPTION: No dfchba instance available for RSCN event - dropping.
DATA:
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes1926 Exec format error

DESCRIPTION: No dfchba instance available for IOCTL loopback test - dropping.
DATA:
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes1927 Exec format error, Dropping temp event

DESCRIPTION: No dfchba instance available for Temperature event - dropping
DATA:
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes1928 Exec format error, Dropping dump event

DESCRIPTION: No dfchba instance available for Dump event - dropping
DATA:
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes1929 Exec format error

DESCRIPTION: No dfchba instance available for IOCTL loopback xri read - dropping.
DATA:
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes1934 ENOMEM DMA coherent resource unavailable

DESCRIPTION: Driver failed to allocate a DMA buffer for an IOCTL request.
DATA:
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes1935 Loopback test did receive any data

DESCRIPTION: Driver ran loopback test, but did not receive a response.

DATA:
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes1936 ENOMEM Kernel resource unavailable

DESCRIPTION: Driver failed to allocate DMA buffer during loopback test.
DATA:
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes1944 ENOMEM kernel memory resource unavailable

DESCRIPTION: Driver failed to allocate kernel buffer for timed out IO request.
DATA:
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes1949 ENOEXEC NULL parameter passed to function

DESCRIPTION: Driver tried to post receive buffer, but no receive buffers available.
DATA:
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes1950 ENOMEM IOCB resource not available

DESCRIPTION: Driver could not allocate IOCBs needed to post loopback receive buffers.
DATA: (1) (2) (3)
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes1951 ENOMEM MBUF resource not available

DESCRIPTION: Driver failed to get memory buffer needed for loopback test.
DATA:
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes1952 ENOMEM DMA resource not available

DESCRIPTION: Driver failed to get DMA buffers needed for loopback test
DATA: (1) (2) (3)
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes1957 EPERM Illegal BDE count [%d]

DESCRIPTION: Driver received too many receive buffers for loopback operation.
DATA: (1) receive buffer count
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes2000: Failed to allocate mbox for READ_FCF cmd

DESCRIPTION: Failed to allocate mbox for READ_FCF command.
DATA: None
ACTION: None required.

elx_mes2001: Unable to allocate memory for issuing SLI_CONFIG_SPECIAL mailbox command

DESCRIPTION: Unable to allocate memory for issuing the SLI_CONFIG_SPECIAL mailbox command.
DATA: None

ACTION: None required.

elx_mes2002: Error Could not grow rpi count

DESCRIPTION: An error occurred because the RPI count could not be increased.
DATA: None
ACTION: None required.

elx_mes2007: Only Limited Edition cmd Format supported <iocb.ulpCommand>

DESCRIPTION: SLI-4 only supports the Limited Edition command format.
DATA: None
ACTION: None required.

elx_mes2008: Error <rc> posting all rpi headers

DESCRIPTION: The RPI headers could not be posted to the firmware.
DATA: None
ACTION: None required.

elx_mes2009: Failed to allocate mbox for ADD_FCF cmd

DESCRIPTION: Failed to allocate mailbox for ADD_FCF command.
DATA: None
ACTION: None required.

elx_mes2010: Resume RPI Mailbox failed status <status>, mbxStatus <mbx status>.

DESCRIPTION:
DATA: None
ACTION: None required.

elx_mes2011: Unable to allocate memory for issuing SLI_CONFIG_SPECIAL mailbox command

PTION: Unable to allocate memory for issuing SLI_CONFIG_SPECIAL mailbox command.
DATA: None
ACTION: None required.

elx_mes2012: Mailbox failed , mbxCmd <mbx_cmd> READ_CONFIG, mbxStatus <mbx status>.

DESCRIPTION: The READ_CONFIG mailbox command failed.
DATA: None
ACTION: None required.

elx_mes2013: Could not manually add FCF record 0, status <rc>

DESCRIPTION: Could not add FCF record to the FCF list.
DATA: None
ACTION: None required.

elx_mes2014: Invalid command <iocb.ulpCommand>

DESCRIPTION: The IOCB command is invalid.
DATA: None
ACTION: None required.

elx_mes2015: Invalid CT %x command <iocb.ulpCommand>

DESCRIPTION: Invalid Command-Type in the IOCB is not supported.
DATA: None
ACTION: None required.

elx_mes2017: REG_FCFI mbxStatus error <mbx status> HBA state <port_state>.

DESCRIPTION: The REG_FCFI mailbox command has failed.
DATA: None
ACTION: None required.

elx_mes2018: REG_VFI mbxStatus error <mbx status> HBA state <port_state>.

DESCRIPTION: The REG_VFI mailbox command has failed.
DATA: None
ACTION: None required.

elx_mes2022: INIT VPI Mailbox failed status <status>, mbxStatus <mbxStatus>

DESCRIPTION: The INIT VPI mailbox command has failed.
DATA: None
ACTION: None required.

elx_mes2401: Failed to allocate memory for ELS XRI management array of size <els_xri_cnt>.

DESCRIPTION: Initialization failed to allocate memory for the ELS XRI management array.
DATA: None
ACTION: None required.

elx_mes2500: EQ_CREATE mailbox failed with status <shdr_status> add_status <shdr_add_status>, mbx status <rc>

DESCRIPTION: The mailbox command sent to create the event queue has failed.
DATA: None
ACTION: None required.

elx_mes2501: CQ_CREATE mailbox failed with status <shdr_status> add_status <shdr_add_status>, mbx status <rc>

DESCRIPTION: The mailbox command sent to create the completion queue has failed.
DATA: None
ACTION: None required.

elx_mes2502: MQ_CREATE mailbox failed with status <shdr_status> add_status <shdr_add_status>, mbx status <rc>

DESCRIPTION: The mailbox command sent to create the mailbox queue has failed.
DATA: None
ACTION: None required.

elx_mes2503: WQ_CREATE mailbox failed with status <shdr_status> add_status <shdr_add_status>, mbx status <rc>

DESCRIPTION: The mailbox command sent to create the work queue has failed.
DATA: None
ACTION: None required.

elx_mes2504: RQ_CREATE mailbox failed with status <shdr_status> add_status <shdr_add_status>, mbx status <rc>

DESCRIPTION: The mailbox command sent to create the receive queue has failed.
DATA: None
ACTION: None required.

elx_mes2505: EQ_DESTROY mailbox failed with status <shdr_status> add_status <shdr_add_status>, mbx status <rc>

DESCRIPTION: The mailbox command sent to delete the event queue has failed.
DATA: None
ACTION: None required.
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elx_mes2506: CQ_DESTROY mailbox failed with status <shdr_status> add_status <shdr_add_status>, mbx status <rc>

DESCRIPTION: The mailbox command sent to delete the completion queue has failed.
DATA: None
ACTION: None required.

elx_mes2507: MQ_DESTROY mailbox failed with status <shdr_status> add_status <shdr_add_status>, mbx status <rc>

DESCRIPTION: The mailbox command sent to delete the mailbox queue has failed.
DATA: None
ACTION: None required.

elx_mes2508: WQ_DESTROY mailbox failed with status <shdr_status> add_status <shdr_add_status>, mbx status <rc>

DESCRIPTION: The mailbox command sent to delete the work queue has failed.
DATA: None
ACTION: None required.

elx_mes2509: RQ_DESTROY mailbox failed with status <shdr_status> add_status <shdr_add_status>, mbx status <rc>

DESCRIPTION: The mailbox command sent to delete the receive queue has failed.
DATA: None
ACTION: None required.

elx_mes2510: RQ_DESTROY mailbox failed with status <shdr_status> add_status <shdr_add_status>, mbx status <rc>

DESCRIPTION: The mailbox command sent to delete the receive queue has failed.
DATA: None
ACTION: None required.

elx_mes2511: POST_SGL mailbox failed with status <shdr_status> add_status <shdr_add_status>, mbx status <rc>

DESCRIPTION: The mailbox command sent to post the SGL pages to the firmware has failed.
DATA: None
ACTION: None required.

elx_mes2513: POST_SGL_BLOCK mailbox command failed status <shdr_status> add_status <shdr_add_status> mbx status <rc>

DESCRIPTION: The mailbox command sent to post the SGL pages to the firmware has failed.
DATA: None
ACTION: None required.

elx_mes2514: POST_RPI_HDR mailbox failed with status <shdr_status> add_status <shdr_add_status>, mbx status <rc>

DESCRIPTION: The mailbox command sent to post the RPUI header pages to the firmware has failed.
DATA: None
ACTION: None required.

elx_mes2515: ADD_FCF_RECORD mailbox failed with status <rc>

DESCRIPTION: The mailbox command to add the FCF record has failed.
DATA: None
ACTION: None required.

elx_mes2519: Unable to allocate memory for issuing NOP mailbox command

DESCRIPTION: Memory allocation for this mailbox command has failed.
DATA: None
ACTION: None required.

elx_mes2521: READ_FCF_RECORD mailbox failed with status <shdr_status> add_status <shdr_add_status>, mbx

DESCRIPTION: The READ_FCF_RECORD mailbox command has failed.
DATA: None
ACTION: None required.

elx_mes2522 Synchronous READ_FCF_RECORD mailbox failed with status x%x add_status x%x

DESCRIPTION: Driver failed to read the active FCF Record on an FCoE link - FCF may not be available.
DATA:
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes2523: Allocated DMA memory size (<alloc_len>) is less than the requested DMA memory size (<req_len>)

DESCRIPTION: The ADD_FCF_RECORD mailbox command failed to retrieve the length required from the firmware.
DATA: None
ACTION: None required.

elx_mes2524: Failed to get the non-embedded SGE virtual address

DESCRIPTION: The READ_FCF_RECORD mailbox command could not retrieve the Scatter Gather Entry that was requested.
DATA: None
ACTION: None required.

elx_mes2527: Failed to allocate non-embedded SGE array.

DESCRIPTION: Failed to allocate the non-embedded SGE array.
DATA: None
ACTION: None required.

elx_mes2528: Mailbox command <vpi> cannot issue

DESCRIPTION: The mailbox command could not be issued because the mailbox interrupt is disabled.
DATA: (1) mbxCommand, (2) sli_flag, (3) flag
ACTION: None required.

elx_mes2529: Mailbox command <vpi> cannot issue

DESCRIPTION:
DATA: (1) mbxCommand, (2) sli_flag, (3) flag
ACTION: None required.

elx_mes2530: Mailbox command <vpi> cannot issue

DESCRIPTION: The SLI layer in the driver is inactive.
DATA: (1) mb.mbxCommand, (2) sli_flag, (3) flag
ACTION: None required.

elx_mes2531: Mailbox command <cpi> cannot issue

DESCRIPTION:
DATA: (1) mb.mbxCommand, (2) sli_flag, (3) flag
ACTION: None required.

elx_mes2532: Mailbox command <vpi> (<mbxCommand>) cannot issue

DESCRIPTION: The mailbox bootstrap code detected that the SLI layer is active.
DATA: (1) sli4_mbox_opcode, (2) sli_flag, (3) MBX_POLL
ACTION: None required.

elx_mes2533: Mailbox command <vpi> (<mbxCommand>) cannot issue

DESCRIPTION:
DATA: (1) sli4_mbox_opcode, (2) sli_flag, (3) MBX_NOWAIT
ACTION: None required.

elx_mes2535: Unsupported RQ count. (<entry_count>).

DESCRIPTION: The receive queue ring can only be 512, 1024, 2048, or 4096.
DATA: None
ACTION: None required.

elx_mes2536: Unsupported RQ count. (<entry_count>).

DESCRIPTION: The receive queue ring can only be 512, 1024, 2048, or 4096.
DATA: None
ACTION: None required.

elx_mes2537: Receive Frame Truncated!

DESCRIPTION: The receive unsolicited handler detected a truncated frame.
DATA: None

ACTION: None required.

elx_mes2541: Mailbox command <vpi> (<mbxCommand>) cannot issue

DESCRIPTION:
DATA: (1) sli4_mbx_opcode, (2) sli_flag, (3) flag
ACTION: None required.

elx_mes2543: Mailbox command <vpi> (<mbxCommand>) cannot issue

DESCRIPTION: The mailbox command does not have all of the fields set correctly.
DATA: (1) sli4_mbx_opcode, (2) sli_flag, (3) flag
ACTION: None required.

elx_mes2544: Mailbox command <vpi> (<mbxCommand>) cannot issue

DESCRIPTION: The adapter cannot be accessed on the PCI bus.
DATA: (1) sli4_mbx_opcode, (2) sli_flag, (3) flag
ACTION: None required.

elx_mes2546: New FCF found index <index> tag <event_tag>

DESCRIPTION: A new FCF has been found.
DATA: None
ACTION: None required.

elx_mes2547: Read FCF record failed

DESCRIPTION: Could not read the FCF record from the firmware.
DATA: None
ACTION: None required.

elx_mes2548: FCF Table full count <count> tag <event_tag>

DESCRIPTION: The FCF table is full.
DATA: None
ACTION: None required.

elx_mes2549: FCF disconnected from network index <index> tag <event_tag>.

DESCRIPTION: The FCF has disconnected from the network.
DATA: None
ACTION: None required.

elx_mes2550: UNREG_FCFI mbxStatus error <u.mb.mbxStatus> HBA state <port_state>.

DESCRIPTION: The unregistered FCFI has failed.
DATA: None
ACTION: None required.

elx_mes2551: UNREG_FCFI mbox allocation failed HBA state <port_state>.

DESCRIPTION: The allocation for the UNREG_FCFI mailbox command has failed.
DATA: None
ACTION: None required.

elx_mes2552: UNREG_FCFI issue mbox failed rc <rc> HBA state <port_state>.

DESCRIPTION: The unregister FCFI mailbox command has failed.
DATA: None
ACTION: None required.

elx_mes2553: lpfc_unregister_unused_fcf failed to read FCF record HBA state.

DESCRIPTION:
DATA: None
ACTION: None required.

elx_mes2554: Could not allocate memory for fcf record

DESCRIPTION:
DATA: None
ACTION: None required.

elx_mes2555: UNREG_VFI mbxStatus error <u.mb.mbxStatus> HBA state <port_state>

DESCRIPTION: The unregister VFI mailbox command has failed.
DATA: None
ACTION: None required.

elx_mes2556: UNREG_VFI mbox allocation failed HBA state <port_state>

DESCRIPTION: Could not allocate memory for UNREG_VFI mailbox command.
DATA: None
ACTION: None required.

elx_mes2557 UNREG_VFI issue mbox failed rc <rc> HBA state <port_state>

DESCRIPTION: Could not issue the UNREG_VFI mailbox command.
DATA: None
ACTION: None required.

elx_mes2558: ADD_FCF_RECORD mailbox failed with status<shdr_status> add_status <shdr_add_status>

DESCRIPTION: The ADD_FCF_RECORD mailbox command has failed.
DATA: None
ACTION: None required.

elx_mes2560: Failed to allocate mbox cmd memory

DESCRIPTION: Failed to allocate mailbox command memory.
DATA: None
ACTION: None required.

elx_mes2561: Allocated DMA memory size (<alloclen>) is less than the requested DMA memory size (<reqlen>)

DESCRIPTION: Could not get the memory required for the number of XRIs that are attempting to be posted.
DATA: None
ACTION: None required.

elx_mes2562: No room left for SCSI XRI allocation: max_xri=<sli4_hba.max_cfg_param.max_xri>, els_xri=<els_xri_cnt>

DESCRIPTION: The number of allocated XRIs has reached the max_xri value.
DATA: None
ACTION: None required.

elx_mes2563: Failed to allocate memory for SCSI XRI management array of size <sli4_hba.scsi_xri_max>.

DESCRIPTION: Initialization could not allocate memory to hold the XRIs.
DATA: None
ACTION: None required.

elx_mes2564: POST_SGL_BLOCK mailbox command failed status <shdr_status> add_status <shdr_add_status> mbx status <rc>

DESCRIPTION: The list of XRI SGEs failed to be registered with the firmware.
DATA: None
ACTION: None required.

elx_mes2566: Failed to allocate connection table entry

DESCRIPTION: Failed to allocate connection table entry.
DATA: None
ACTION: None required.

elx_mes2567: Config region 23 has bad signature

DESCRIPTION: Configuration region 23 has an invalid signature.
DATA: None
ACTION: None required.

elx_mes2568: Config region 23 has bad version

DESCRIPTION: Configuration region 23 has an invalid version.
DATA: None
ACTION: None required.

elx_mes2570: Failed to read FCoE parameters

DESCRIPTION: Failed to read the FCoE parameters.
DATA: None
ACTION: None required.

elx_mes2572: Failed allocate memory for fast-path per-EQ handle array

DESCRIPTION: Failed to allocate memory for the fast-path per-EQ handle array.
DATA: None
ACTION: None required.

elx_mes2573: Failed allocate memory for msi-x interrupt vector entries

DESCRIPTION: Failed to allocate memory for MSI-X interrupt vector entries.
DATA: None
ACTION: None required.

elx_mes2574: Not enough EQs (<sli4_hba.max_cfg_param.max_eq>) from the pci function for supporting FCP EQs (<cfg_fcp_eq_count>)

DESCRIPTION: Failed to create the minimum fast-path event queues.
DATA: None
ACTION:

elx_mes2576: Failed allocate memory for fast-path EQ record array

DESCRIPTION: Failed to allocate memory for the fast-path EQ record array.
DATA: None
ACTION: None required.

elx_mes2577: Failed allocate memory for fast-path CQ record array

DESCRIPTION: Failed to allocate memory for the fast-path CQ record array.
DATA: None
ACTION: None required.

elx_mes2578: Failed allocate memory for fast-path WQ record array

DESCRIPTION: Failed to allocate memory for the fast-path WQ record array.
DATA: None
ACTION: None required.

elx_mes2581: Not enough WQs (<sli4_hba.max_cfg_param.max_wq>) from the pci function for supporting FCP WQs (<cfg_fcp_wq_count>)

DESCRIPTION: The driver was not configured with the minimum number of fast-path work queues.
DATA: None
ACTION: None required.

elx_mes2597: Mailbox command <vpi> (<mbxCommand>) cannot issue

DESCRIPTION: Synchronous mailbox command failed after blocking asynchronous mailbox commands.
DATA: (1) sli4_mbx_opcode, (2) sli_flag, (3) flag
ACTION: None required.

elx_mes2598: Adapter Link is disabled.

DESCRIPTION: The adapter link is disabled.
DATA: None
ACTION: None required.

elx_mes2599: Adapter failed to issue DOWN_LINK mbox command rc <rc>.

DESCRIPTION: The adapter failed to issue a DOWN_LINK mailbox command.
DATA: None
ACTION: None required.

elx_mes2600: lpfc_sli_read_serdes_param failed to allocate mailbox memory

DESCRIPTION: Failed to allocate mailbox memory.
DATA: None
ACTION: None required.

elx_mes2605: lpfc_dump_static_vport: memory allocation failed

DESCRIPTION: Memory allocation failed.
DATA: None
ACTION: None required.

elx_mes2606: No NPIV Fabric support

DESCRIPTION: No NPIV Fabric support.
DATA: None
ACTION: None required.

elx_mes2607: Failed to allocate init_vpi mailbox

DESCRIPTION: Failed to allocate init_vpi mailbox.
DATA: None
ACTION: None required.

elx_mes2608: Failed to issue init_vpi mailbox

DESCRIPTION: Failed to issue init_vpi mailbox.
DATA: None
ACTION: None required.

elx_mes2609: Init VPI mailbox failed <u.mb.mbxStatus>

DESCRIPTION: Initialization of VPI mailbox has failed.
DATA: None
ACTION: None required.

elx_mes2610: HBA FCF index goes beyond driver's resource dimension.

DESCRIPTION: During updating the round robin FCF bmask, the FCF index goes beyond the driver's internal resource dimension.
DATA: None
ACTION: None required.

elx_mes2619: Config region 23 has bad signature

DESCRIPTION: Configuration region 23 has an invalid signature.
DATA: None
ACTION: None required.

elx_mes2620: Config region 23 has bad version

DESCRIPTION: Configuration region 23 has an invalid version.
DATA: None
ACTION: None required.

elx_mes2621: Failed to allocate mbox for query firmware config cmd

DESCRIPTION: Failed to allocate mailbox memory.
DATA: None
ACTION: None required.

elx_mes2622: Query Firmware Config failed mbx status <rc>, status <shdr_status> add_status <shdr_add_status>

DESCRIPTION: Could not read the firmware configuration.
DATA: None
ACTION: None required.

elx_mes2623: FCoE Function not supported by firmware. Function mode = <function_mode>

DESCRIPTION: FCoE is not supported by this firmware.
DATA: None
ACTION: Use the OneCommand Manager application to update to the latest firmware.

elx_mes2705 Failed to enable interrupt

DESCRIPTION: Driver to enable any interrupt mode - fatal - driver unloads.
DATA:
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes2707: Ring <Ring#> handler: Failed to allocate iocb Rctl <fh_rctl> Type <fh_type> received

DESCRIPTION: Could not allocate an IOCB with which to associate this received frame.
DATA: None
ACTION: None required.

elx_mes2710 PCI channel disable preparing for reset

DESCRIPTION: Driver is resetting the PCI slot for this port - starting preparations.
DATA:
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes2711 PCI channel permanent disable for failure

DESCRIPTION: Driver has detected a fatal port error - disabling PCI channel.
DATA:
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes2718: Clear Virtual Link Received for VPI <index> tag <event_tag>

DESCRIPTION: A Clear virtual link was received from the Fabric for this VPI.
DATA: None
ACTION: None required.

elx_mes2719: Invalid response length: tgt <TGT_ID> lun <LUN> cmnd <CMD> rsplen <RSPLEN>

DESCRIPTION: The response length for this FCP command is not supported.
DATA: None
ACTION: None required.

elx_mes2723 PCI channel I/O abort preparing for recovery

DESCRIPTION: Driver is preparing port PCI channel for reset/recovery after IO error.
DATA:
ACTION: Software driver error. If this problem persists, report these errors to Technical Support.

elx_mes2726: READ_FCF_RECORD Indicates empty FCF table

DESCRIPTION: The driver requested the firmware provide a list of FCF entries to connect to and the firmware responded that the FCF table is empty.
DATA: None
ACTION: None required.

elx_mes2729 Unable to dma_map_single request_buffer: x%x

DESCRIPTION: Driver unable to map SCSI command scatter-gather buffer.
DATA: (1) dma mapping error.
ACTION: Software driver error. If this problem persists, report these errors to Technical Support.

elx_mes2731: Cannot find fabric controller node.

DESCRIPTION: Driver not able to find Fabric controller node in its data base.
DATA: None
ACTION: None required

elx_mes2732: Failed to issue INIT_VPI mailbox command.

DESCRIPTION: The driver wanted to send a INIT_VPI mailbox command to initialize a VPort, but failed to send the mailbox command due to state of the adapter.
DATA: None
ACTION: None required

elx_mes2745 Failed to allocate mbox for requesting FCF rediscover

DESCRIPTION: Driver is trying to rediscover FCF table, but failed to allocate memory needed.
DATA:
ACTION: Software driver error. If this problem persists, report these errors to Technical Support.

elx_mes2746: Failed FCF rediscover mailbox command failure.

DESCRIPTION: The adapter returned failure on FCF rediscover mailbox command.
DATA: None
ACTION: None required

elx_mes2747: Failed to issue read FCF record mailbox command.

DESCRIPTION: The driver wanted to send a read FCF record mailbox command to start fast FCF failover FCF scan, but failed to send the mailbox command due
to state of the adapter.
DATA: None
ACTION: None required

elx_mes2748 Failed to prepare for unregistering HBA's FCF record: rc=%d

DESCRIPTION: Driver encountered an initialization error when preparing to rescan the FCF tables and needed to unregister an old FCF record.
DATA:
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes2749 Failed to prepare for unregistering HBA's FCF record: rc=%d

DESCRIPTION: Driver encountered an initialization error when preparing to unregister an FCF and needed to prepare the command.

DATA:
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes2751: Adapter failed to restart, status reg <status>,FW Data: A8 <0xA8> AC <0xAC>

DESCRIPTION: The adapter has failed to restart.
DATA: None
ACTION: If the problem persists, report the error to Technical Support.

elx_mes2752: KILL_BOARD command failed retval <retval>

DESCRIPTION: The KILL BOARD mailbox command failed to complete.
DATA: None
ACTION: If the problem persists, report the error to Technical Support.

elx_mes2753: PLOGI failure DID:<DID> Status:<Status>/<Extended Status>.

DESCRIPTION: A PLOGI to <DID> was failed either by the driver, firmware, or target. The <status> and <extended status> indicates why the PLOGI failed.
DATA: None
ACTION: If the problem persists, report the error to Technical Support.

elx_mes2754: PRLI failure DID:<DID> Status:<Status>/<Extended Status>.

DESCRIPTION: A PRLI to <DID> was failed either by the driver, firmware, or target. The <status> and <extended status> indicates why the PRLI failed.
DATA: None
ACTION: If the problem persists, report the error to Technical Support.

elx_mes2755: ADISC failure DID:<DID> Status:<Status>/<Extended Status>.

DESCRIPTION: A ADISC to <DID> was failed either by the driver, firmware, or target. The <status> and <extended status> indicates why the ADISC failed.
DATA: None
ACTION: If the problem persists, report the error to Technical Support.

elx_mes2756: LOGO failure DID:<DID> Status:<Status>/<Extended Status>.

DESCRIPTION: A LOGO to <DID> was failed either by the driver, firmware, or target. The <status> and <extended status> indicates why the LOGO failed.
DATA: None
ACTION: If the problem persists, report the error to Technical Support.

elx_mes2757: Protocol failure detected during processing of FCP I/O op: tgt <tgt ID> lun <LUN> cmnd <CMD> rspInfo3 <rspInfo3>

DESCRIPTION: The FCP response from a target indicated that the response length is valid, but rspInfo3 indicates that there is no Failure. This is a FCP spec violation by the target.
DATA: None
ACTION: If the problem persists, report the error to Technical Support.

elx_mes2758: Failed to allocate mempool for read FCF record mbox command.

DESCRIPTION: The driver failed to allocate memory from the mempool for issuing FCF read mailbox command during the round robin FCF bmask update.
DATA: None

ACTION: None required

elx_mes2759: Failed to allocate memory for round robin FCF failover bmask.

DESCRIPTION: The driver failed to allocate memory for the round robin FCF failover bmask.
DATA: None
ACTION: Make sure system has enough kernel memory, might need to reload the driver after memory problem resolved.

elx_mes2762: HBA reported FCF index go beyond driver bmask dimension.

DESCRIPTION: Adapter reports an FCF record index goes beyond the driver's internal resource dimension for the bmask.
DATA: None
ACTION: Inform Emulex about this.

elx_mes2763: Failed to allocate mempool for read FCF record mbox command.

DESCRIPTION: The driver failed to allocate memory from the mempool for issuing an FCF read mailbox command during the round robin FCF failover.
DATA: None
ACTION: None required

elx_mes2765 Mailbox command READ_FCF_RECORD failed to retrieve a FCF record

DESCRIPTION: Driver failed to find an FCF record when the FCF table scan completed.
DATA:
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes2772: Failed to issue FCF rediscovery mailbox command due to dead FCF.

DESCRIPTION: The driver wanted to send an FCF rediscovery mailbox command to start fast FCF failover due to a dead FCF asynchronous event, but failed to send the mailbox command due to state of the adapter.
DATA: None
ACTION: None required

elx_mes2774: Failed to issue FCF rediscovery mailbox command due to CVL.

DESCRIPTION: The driver wanted to send an FCF rediscovery mailbox command to start fast FCF failover due to a Clear Virtual Link asynchronous event, but failed to send the mailbox command due to state of the adapter.
DATA: None
ACTION: None required

New Events

elx_mes2796: Mailbox memory allocation failed

DESCRIPTION: The driver failed to get memory resources to release an RPI
DATA: None.

ACTION: None. The driver's heap is exhausted. A server reboot is required to fix the exhaustion. Contact technical support if the problem persists.elx_mes2798: Unreg_vpi failed vpi 0x%x, mb status = 0x%x

DESCRIPTION: The driver attempted to unregister a virtual port index and failed. The failure status is printed.
DATA: None.
ACTION: This condition is not catastrophic, but is unexpected. If problems persist, contact technical support.

elx_mes2813: Mgmt IO is Blocked %x - mbox cmd %x still active.

DESCRIPTION: The HBA's management interface is marked as blocked in preparation for an online or offline state transition. All user space access to the HBA via libdfc interface will be blocked.
DATA: None.

ACTION: None. Notification of a run-state change only.elx_mes2822: IOCB failed %s iotag 0x%x xri 0x%x

DESCRIPTION: The driver is attempting to drain an internal queue and failed. The failure reason and some state variables are written to the console.
DATA: None
ACTION: None required. This should be a transient condition. If not, please contact technical support.

elx_mes2823: txq empty and txq_cnt is %d

DESCRIPTION: The driver has detected a discrepancy between the elements queued to the txq and the counter tracking the number or items.
DATA: None
ACTION: None required. There is nothing for the driver to do except correct the counter - the txq is empty.

elx_mes2824: Cannot re-enable interrupt after slot reset.

DESCRIPTION: The driver failed to re-enable interrupts following a PCI slot reset command.
DATA: None
ACTION: A system reboot may be required to fully recover. Contact technical support if problems persist.

elx_mes2825: Unknown PCI error state: x%x\n", state

DESCRIPTION: The driver writes this message to the console when the PCI subsystem has detected an error on an Emulex port and called the driver. The driver reacts by resetting the port.
DATA: None
ACTION: None required. The driver resets the device in an attempt to recover. Contact technical support if problems persist.

elx_mes2826: PCI channel disable preparing for reset

DESCRIPTION: The driver writes this message to the console when it is preparing the port for a reset operation.
DATA: None
ACTION: None required. This message is notification of a corrective measure. Contact technical support if problems persist.

elx_mes2827: PCI channel permanent disable for failure

DESCRIPTION: The driver writes this message to the console when a recovery mechanism has failed and the driver wants to mark the port with a permanent failure.
DATA: None
ACTION: A system reboot may correct the failure. If not, contact technical support.

elx_mes2828: PCI channel I/O abort preparing for recovery

DESCRIPTION: The driver writes this message to the console when it is preparing the port for a recovery operation.
DATA: None
ACTION: None required. This is a notification message for the recovery action.

elx_mes2831: FLOGI response with cleared Fabric bit fcf_index 0x%x Switch Name %02x%02x%02x%02x%02x%02x%02x%02x Fabric Name %02x%02x%02x%02x%02x%02x%02x%02x

DESCRIPTION: When the driver completed a FLOGI, the common service parameters did not indicate an FPort or NPort remote node. The driver treats this as an error.
DATA: None
ACTION: Validate the external cable connection and FPort/Nport configuration. Contact technical support if problems persist.

elx_mes2858: FLOGI failure Status:x%x/x%x TMO:x%x

DESCRIPTION: The driver issued a FLOGI, but never received any completion with the timeout period. The driver is marking the FLOGI as failed and stops discovery.
DATA: None
ACTION: Please check your fabric to ensure it it operating correctly. Contact technical support if problems persist.

elx_mes2862: FCF (x%x) matches property of in-use FCF (x%x)

DESCRIPTION: The driver has found an FCF record that matches the properties of the current FCF record, except for the VLAN id and Index. The driver will attempt to use this FCF.
DATA: None
ACTION: None required. The driver is in its FCF discovery phase and is trying to recover a match to its in-use FCF.

elx_mes2863 New FCF (x%x) matches property of in-use FCF (x%x)

DESCRIPTION: The driver has found a new FCF record that matches the properties of the current FCF record, but the record instance numbers don't match.
DATA: None
ACTION: None required. The driver is in its FCF discovery phase and is trying to recover a match to its in-use FCF.

elx_mes2877 FCP XRI exchange busy wait time: %d seconds

DESCRIPTION: An FCP exchange cannot be released - no port completion. Driver is waiting.
DATA:
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes2878 2878 ELS XRI exchange busy wait time: %d seconds

DESCRIPTION: An ELS exchange cannot be released - no port completion. Driver is waiting
DATA:
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes2881 RRQ failure DID:%06X Status:x%x/x%x

DESCRIPTION: Driver RRQ request failed - driver write target DID and status values.
DATA:
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes2882 RRQ completes to NPort x%x with no ndlp. Data: x%x x%x x%x

DESCRIPTION: Driver completes a RRQ, but there is no node association.
DATA: (1) Status (2) Reason (3) IoTag
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

elx_mes2884 Vport array allocation failed

DESCRIPTION: Driver could not create a buffer list of vports.
DATA:
ACTION: Software driver error. If this problem persists, report these errors to Technical Support

Troubleshooting the NIC Driver

The following table providestroubleshooting information for the NIC driver.

Table 4: Troubleshooting the NIC Driver

Problem	Answer/Solution

1. When there is a great deal of network traffic in some VMs, a few VMs appear to have lost network connectivity.
2. Several "alloc_skb() failed" messages appear in the log file: /proc/vmware/log
	This could be due to low configured value for netPktHeapMaxSize. Try increasing it to a higher value. To read the current value, run:
	`# esxcfg-advcfg -j netPktHeapMaxSize`
	(A value of 0 indicates default - 64 MB) To increase the size to (for example, 128 MB), run:
	`# esxcfg-advcfg -k 128 netPktHeapMaxSize`
	(netPktHeapMaxSize can also be configured through VI Client using **Configuration** > **Advanced Settings** > **VMKernel.**) After configuring the size, reboot the system.

Unable to ping from one VM to another VM.	The NIC driver creates two vmnic interfaces, one for each port. If these interfaces are configured as uplinks in two separate vSwitches, the VMs in each of these switches are in separate networks with no network path between them. Thus, pinging between the VMs in the two groups fails. If you want all these VMs in the same network, configure them as teaming uplinks to one vSwitch option. Each of the vmnics, vmnic1 to vmnic16, must be configured in a separate vSwitch. In this configuration, there is no network path between the vSwitches and pinging between these VMs does not work.

Table 4: Troubleshooting the NIC Driver (Continued)

Problem	Answer/Solution
Flow control setting is not stored per port after rebooting the system.	With flow control, there is no persistence across reboot. It always starts with both RX and TX on. For persistence, run a config command from an RC file at reboot.

NIC Event/Error Logging

Retrieving ESX Server NIC Error Log Codes

For ESX Server systems, the NIC driver generates error codes to the /var/log/vmkernel log file. The vmkernel log file is an ASCII text file that can be viewed and searched with a text editor such as vim. The vmkernel log file is automatically rotated as it gets larger, and the rotated log files are named vmkernel.x, where x is an integer.

To search the log file for error messages, at the command prompt, type:

```
#cd /var/log
#less vmkernel
```

For example, you might see the following message:

```
Sep 9 19:48:04 esx-server vmkernel: WARNING: Found a OneConnect
card in Gen 1 x8 PCI-e slot. Should be in Gen 2, x8 slot for best
performance.
```

ESX Server NIC Event Log Entries

The following is a list of ESX Server network event log error messages. It includes the severity of the error, the message displayed, and the message description. When reporting a problem with the OneConnect UCNA to Emulex, check the message log (/proc/vmware/log) and report any of these entries that may be present.

Note: In the following table, <D>, <DD>, or <DDD> in the 'Message Displayed' column refers to decimal values that appear in the error messages.

Table 5: ESX Server NIC Event Log Entries

Severity	Message Displayed	Description
Error	OneConnect POST failed	Power ON Self Test of the OneConnect UCNA failed. This indicates either a hardware or a firmware problem. Try rebooting the system after a reset.
Error	`OneConnect initialization failed`	Either the initialization of the OneConnect UCNA or the allocation of some resource for initializing the driver failed. In most cases, this message is accompanied by another more specific error message. Try rebooting the system after a power cycling. If the problem persists, this could indicate a hardware problem or corrupted firmware.

Table 5: ESX Server NIC Event Log Entries (Continued)

Severity	Message Displayed	Description
Warning	`Using INTx interrupts. Net-Queues feature will be disabled`	The driver could not allocate MSIx vector for interrupt. The driver may continue to work, but the performance may be impacted.
Warning	`WARNING: Found a OneConnect card in Gen <D> x<D> PCI-e slot. Should be in Gen 2, x8 slot for best performance`	The OneConnect UCNA is an x8, Gen2 PCI-e device. For best performance, the UCNA should be installed in a Gen2 PCI-e slot 8 or 16 channels wide. The driver displays this warning if it finds the device in a slower or narrower PCI-e slot. The device continues to work with reduced performance.
Warning	`Command to get pause frame settings failed`	The firmware command to get PAUSE settings failed.
Warning	`Command to set pause frame settings failed`	The firmware command to change PAUSE settings failed.
Warning	`Command to apply MAC address filter failed`	The driver could not set the MAC address filter on the hardware. The device continues to work. There may be an impact on the performance.
Warning	`Command to delete MAC address filter failed`	The firmware command to delete a MAC address filter failed. The device should continue to work.
Warning	`Unable to get Firmware Version`	The command to get the firmware revision number failed. The version number is not shown. The device will continue to work.
Warning	`Did not receive completions for all TX requests`	While the driver was unloading, some outstanding transmit requests were found. This is an indication that the hardware is not functioning properly.
Warning	`Failed to register char device`	Could not create the char device used for certain management functions. The driver will continu to work. You may not be able to use HBACMD to interact with the device.
Warning	`alloc_skb failed. Try increasing netPktHeapMaxSize`	Could not allocate the skb structure to send a frame received from the network to the operating system. This is a transient failure that can be ignored. If this message appears continually, you may need to allocate more memory to the network heap. For example, to increase the heap size to 128MB, run: `# esxcfg-advcfg -k 128 netPktHeapMaxSize`
Warning	`Invalid MTU requested. MTU must be between 64 and 9000 bytes.`	Invalid MTU size in MTU configuration ioctl. The MTU will not be changed.
Warning	`Invalid vlan priority labeled. Must be 0 - 7`	A request to set a VLAN priority tag was made with an invalid value.

Table 5: ESX Server NIC Event Log Entries (Continued)

Severity	Message Displayed	Description
Warning	`Failed to allocate memory for pass through command`	The memory allocation for a pass through command failed. The driver will continue to function. The configuration utility that issued the pass through ioctl will fail.
Warning	Pass through command failed. opcode <DDD>, status 0x<XXX>	The pass through firmware command with the indicated opcode failed. The driver should continue to function. The configuration utility that issued the pass through ioctl will fail.
Warning	Command to modify EQ delay failed	The firmware command to change the EQ delay failed. The driver will continue to function. Adaptive interrupt coalescing does not function correctly.

NIC Adapter Firmware Error

The following POST message appears if you have loaded firmware on the OneConnect adapter that the controller does not support:

```
POST Error : Firmware halted. This firmware does not support this
controller.
```

Troubleshooting the iSCSI Driver

The following table provides information on troubleshooting the iSCSI driver.

Table 6: iSCSI Troubleshooting Information

Problem	Solution
When logging into more than 139 targets, only 139 targets appear in vmkernel.	By default, ESX can only show 139 targets even if up to 256 are supported. To log into more than 139 targets and allowing these targets to appear in vmkernel, you need to configure the tunable parameter: vmklinuxHeapMaxSizeMB. There are two methods to set this tunable parameter, on the command line or with VI Client. To set the parameter by the command line option, set the value: esxcfg-advcfg -k <MBs> vmklinuxHeapMaxSizeMB For example: esxcfg-advcfg -k 48 vmklinuxHeapMaxSizeMB To set the parameter by using VI Client: Under Configuraton tab -> Advanced Settings ->vmkernel, set VMKernel.Boot.vmklinuxHeapMaxSizeMB to 48. **Note:** After you complete setting the value, you must reboot the ESX machine.
Mutual CHAP authentication cannot be configured with the vSphere client.	One-way CHAP is the only authentication method that can be configured with the vSphere Client. In order to set Mutual CHAP authentication, you must use iSCSISelect.

Retrieving iSCSI Error Log Codes

The iSCSI driver generates error codes to the /var/log/vmkernel log file. The vmkernel log file is an ASCII text file that can be viewed and searched with a text editor such as vim. The vmkernel log file is automatically rotated as it gets larger, and the rotated log files are named vmkernel.x, where x is an integer.

To search the log file for error messages, at the command prompt type:

```
#cd /var/log
#vim vmkernel
```

For example, you may see the following message:

```
Sep 9 19:48:04 esx-server vmkernel: OneConnect iSCSI Driver: The
be2iscsi driver received a Task Management Function that is not
supported and rejected this request. The error log entry
immediately following this entry will indicate the TMF function
code that was rejected.
```

iSCSI Error Log Code Entries

The following is a brief description of the error log codes generated by the iSCSI driver. It includes the message displayed, the meaning of the message, and the recommended resolution.

Table 7: iSCSI Error Log Code Entries

Message	Recommended Resolution
The be2iscsi driver failed to load because initialization failed during a power management bootup.	This failure may be due to the firmware not being present or running currently. This failure may also indicate a hardware problem.
The be2iscsi driver failed was unable to map one or more PCI Base Address Register and hence failed to load.	This failure may indicate a low memory condition or a hardware error.
The be2iscsi driver ignored a configuration entry since the entry was invalid.	Check the registry configuration for any new entries added for driver parameters. The invalid entry must be removed or corrected.
The be2iscsi driver failed to load due to memory allocation failure.	This failure occurred due to a failed memory allocation in the driver. Check low memory conditions.
The be2iscsi driver failed to load because initialization failed during normal bootup.	This failure may be due to the firmware not being present or running currently. This failure may also indicate a hardware problem.
An internal API failed in be2iscsi driver during initialization.	This failure may indicate a low memory condition.

Table 7: iSCSI Error Log Code Entries (Continued)

Message	Recommended Resolution
There was an Unrecoverable Error detected by the be2iscsi driver. Following this error log entry, the next 3 entries will indicate the error codes.	This may be due to hardware errors or due to unhandled exceptions in the hardware or firmware.
The be2iscsi driver failed an IOCTL request since the number of scatter gather elements required for the IOCTL buffer exceeded the OneConnect's firmware limit. Following this error log entry, the next entry will indicate the IOCTL opcode and the payload length requested.	This error may indicate an incorrect configuration option for the iSCSI driver. It may also indicate a low memory condition.
The be2iscsi driver detected an error during offloading the iSCSI connection. The operation will be retried again. Following this error log entry, the next entry will indicate the session handle and the OneConnect firmware error code.	This may indicate a target is in error or may point to transient network connectivity issues. It may also indicate a firmware error.
The be2iscsi driver did not receive an iSCSI command window update up to 25 seconds during I/O operations. Following this error log entry, the next entry will indicate the session handle where this error occurred. The be2iscsi driver will trigger a session recovery on the session and continue.	Check for any errors reported at the target. The iSCSI initiator is only supported with certified Targets. Check for software updates at the target vendor's website. Check for software updates at the Emulex' website. If the above fails, contact technical support.
The be2iscsi driver received an invalid iSCSI Command Sequence Number update from the target. Following this error log entry, the next three entries will indicate the session handle and the iSCSI parameters - MaxCmdSN and ExpCmdSN respectively.	Check for any errors reported at the target. The iSCSI initiator is only supported with certified targets. Check for software updates at the target vendor's website. Check for software updates at the Emulex' website. If the above fails, contact technical support.

Table 7: iSCSI Error Log Code Entries (Continued)

Message	Recommended Resolution
A connection to the target was lost for a period exceeding the Extended Timeout (ETO). The error log entry immediately following this entry will indicate the session ID of the target that lost the connection. There will be event log entries from the disk subsystem indicating that the drives were lost. If any I/Os were in progress, the system may see I/O errors or failures.	Check the connection to the target or the state of the target device. If the target is made available, any sessions that existed previously will be reestablished and the devices will be available for I/O.
The be2iscsi driver received a Task Management Function that is not supported and rejected this request. The error log entry immediately following this entry will indicate the TMF function code that was rejected.	The operating system version is not supported.
The be2iscsi driver received a Task Management Function Abort request for an I/O request that is not present with the driver.	This message may indicate a slow connection to the target. Check network connectivity to the target for any errors.
The be2iscsi driver encountered a mismatched version of the firmware running on the board. This error may be followed by more error codes 0x31840001 or 0x31880001 indicating that the be2iscsi driver failed to load.	This failure indicates that the driver version that is running on the system does not match the version of the firmware flashed on the board. Fix this by installing the desired version.
The be2iscsi driver detected a failure in the hardware during initialization. This error may be followed by more error codes 0x31840001 or 0x31880001 indicating that the be2iscsi driver failed to load.	This failure indicates that the hardware has not been initialized or is malfunctioning. This may also indicate that the firmware is not running correctly.

Table 7: iSCSI Error Log Code Entries (Continued)

Message	Recommended Resolution
Both Port 0 and Port 1 links were down for a period exceeding the Link Down Timeout (LDTO). If the initiator has connection to the target, there will be event log entries from the disk subsystem indicating that the drives were lost. If any I/Os were in progress, the system may see I/O errors or failures.	Check the links to the OneConnect UCNA. If the link is reestablished, any sessions that existed previously will be reestablished and the devices will be available for I/O.
Both Port 0 and Port 1 links are down.	Check the links to the OneConnect UCNA.

Additional iSCSI Driver Messages

The following iSCSI error messages are returned when you specify illegal options when loading the driver:

Table 8: Additional iSCSI Driver Messages

"WARNING: dic value = %d out of range. Valid Range is 0 - 1. Using Default Value = 1"
"WARNING: eto value = %d out of range. Valid Range is 0 - 30. Using Default Value = 30
"WARNING: ldto value = %d out of range. Valid Range is 0 - 30. Using DefaultValue = 20"
"WARNING: ios_per_ctrl value = %d out of range. Valid Range is 1 - 512. Using Default Value = 512"
"WARNING: max_io_size value = %d out of range. Valid Range is 4 - 256 (KByte). Using Default Value = 256"
"WARNING: tmf_reset value= %d out of range. Valid Range is 1 - 3. Using Default Value= 1"
"WARNING: ddm value= %d out of range. Valid Range is 0 - 1. Using Default Value= 0"

Note: %d represents a signed integer outside of the valid range. The driver will return a number in the Warning message.

Any other messages will be returned in the following form:

```
"be2iscsi: FUNCTION_NAME:LINE:MESSAGE"
```

For example:

```
“be2iscsi:1088: kmalloc failed."
```

You will be requested to find the function FUNCTION_NAME at line LINE in the source.

Description of Mandatory and Optional Parameters

The following table describes the parameters used in the data string for option 43:

Table 9: Data String Parameters for Option 43

Parameter	Description	Type of Field
<TargetIP>	Replace it with a valid IPv4 address in dotted decimal notation.	Mandatory
<TargetTCPPort>	Replace it with a decimal number ranging from 1 to 65535 (inclusive). The default TCP port 3260 is assumed, if not specified.	Optional
<LUN>	It is hexadecimal representation of Logical Unit number of the boot device. If not provided, LUN 0 is assumed to be the boot LUN. It is an eight-byte number which should be specified as a hexadecimal number consisting of 16 digits, with an appropriate number of 0's padded to the left, if required.	Optional
<TargetName>	Replace it with a valid iSCSI target iqn name of up to 223 characters.	Mandatory
<InitiatorName>	Replace it with a valid iSCSI iqn name of up to 223 characters. If not provided the default Initiator name (generated by the UCNA based on the board's MAC address) will be used.	Optional
<HeaderDigest>	Replace it with either "E" or "D". • "E" denotes header digest is enabled • "D" denotes that it is disabled.	Optional
<DataDigest>	Replace it with either "E" or "D". • "E" denotes data digest is enabled and • "D" denotes that it is disabled. If not provided it is assumed that Data Digest is disabled by default.	Optional
<AuthenticationType>	If applicable replace it with "D", "E" or "M". • "D" denotes authentication is disabled, • "E" denotes that one-way CHAP is enabled - the username and secret to be used for oneway CHAP must be specified by non-DHCP means • "M" denotes that MutualCHAP is enabled - user name and passwords required for mutual CHAP authentication must be specified by non-DHCP means. If not specified, this field defaults toauthenticationdisabled.	Optional

Examples

The following is an example of Default Initiator name and Data Digest Settings:

```
iscsi:"192.168.0.2":"3261":"0000000000000000E":"iqn.2009-
4.com:1234567890"::"E"::"E"
```

where the following is:

Target IP address: 192.168.0.2

Target TCP port: 3261

Target boot LUN: 0x0E

Target iqn name: iqn.2009-04.com:1234567890

Initiator name: Not specified. Use the Initiator name already configured. Use the default name if none was configured.

Header Digest: Enabled

Data digest: Not specified. Assume disabled.

Authentication Type: 1-way CHAP.

The following is an example of Default TCP Port and Mutual CHAP Settings:

```
iscsi:"192.168.0.2"::"000000000000000E":"iqn.2009-
4.com:1234567890"::"E":"D":"M"
```

where the following is:

Target IP address: 192.168.0.2

Target TCP port: Use default from RFC 3720 (3260)

Target boot LUN: 0x0E

Target iqn name: iqn.2009-04.com:1234567890

Initiator name: Not specified. Use the Initiator name already configured. Use the default name if none was configured.

Header Digest: Enabled

Data digest: Data Digest disabled

Authentication Type: Mutual CHAP

CIM Provider Troubleshooting

The following error message may appear if the CIM hosts are not properly added to the OneCommand Manager:

```
Unknown or invalid host specified
```

There could be instances when even with all the drivers, CIM Provider, and the CIM Client on a Windows machine are properly installed, the CIM hosts might still not get added to OneCommand Manager. Listed below are the most common reasons for this.

- The machine with the specified IP is not reachable. Try pinging the machine.
- The specified protocol (HTTP/HTTPS) is not supported by the CIMOM. Most often the CIMOM will be configured to use HTTPS. So if you are trying to connect with HTTP, you might get an error. Try using HTTPS instead.
- The namespace specified is wrong. Make sure the namespace conforms to the “Namespaces Used for Providers” table in the OneCommand Manager Application User Manual.
- The username or the password specified is wrong. Verify that the username given is correct, and try retyping the password.

- The CIMOM is not running on the ESX/ESXi host. Try restarting the CIMOM. You can check whether the CIMOM (sfcb) is running by typing the below commands.

```
#/etc/init.d/sfcbd-watchdog status
```

or

```
#ps -ef | grep sfcb
```

Also, if the CIMOM is listening to a different port than 5988 or 5989, the connection might not take place. You can configure the sfcb CIMOM settings by editing /etc/sfcb/sfcb.cfg.

If you still experience problems when adding the host, execute the following commands on the ESXi host and send the output to the Emulex Technical Support team.

```
vm-support dump
esxcfg-module -l
esxcfg-scsidevs -a
esxupdate --vib-view query | grep be2
esxupdate --vib-view query | grep lpfc
esxupdate --vib-view query | grep emu
esxcfg-nics -l
lspci
```

Send the “/var/log/messages” file for all of the above operations.

APPENDIX A Configuring iSCSI Through DHCP

Dynamic Host Configuration Protocol (DHCP) Recommendations

If you are using the DHCP server to obtain an IP address for your iSCSI initiator, it is recommended that you set up a reservation. A reservation will assign a specific IP address based on the MAC address of your iSCSI function. If you do not reserve an IP Address through DHCP, then you must set the lease length for the iSCSI initiator IP address to unlimited. This allows the IP address lease not to expire.

Vendor-Specific Option 43

The following section describes the format for the data returned in DHCP vendor-specific option 43. The method and format for specifying the Vendor ID is outside the scope of this User's Guide and is not included here. The Initiator offers this Vendor ID to the DHCP server to retrieve data in the format described in the following section.

Format of Vendor-Specific Option 43

The following describes the format of option 43 and includes guidelines for creating the data string:

```
'iscsi:'<TargetIP>':'<TargetTCPPort>':'<LUN>':'<TargetName>':'<Initiator
Name>':'<HeaderDigest>':'<DataDigest>':'<AuthenticationType>
```

- Strings shown in quotes are part of the syntax and is therefore mandatory
- Fields enclosed in angular brackest (including the angular brackets) should be replaced with their corresponding values. Some of these fields are optional and may be skipped.
- If an optional field is skipped, a colon must be used as a placeholder to indicate the default value for that field.
- When specified, the value of each parameter should be enclosed in double quotes. See *Examples*.
- All options are case sensitive.